September 14, 1929 A McGraw-Hill Publication 20 Cents per Copy

AVIATION

The Oldest American Aeronautical Magazine

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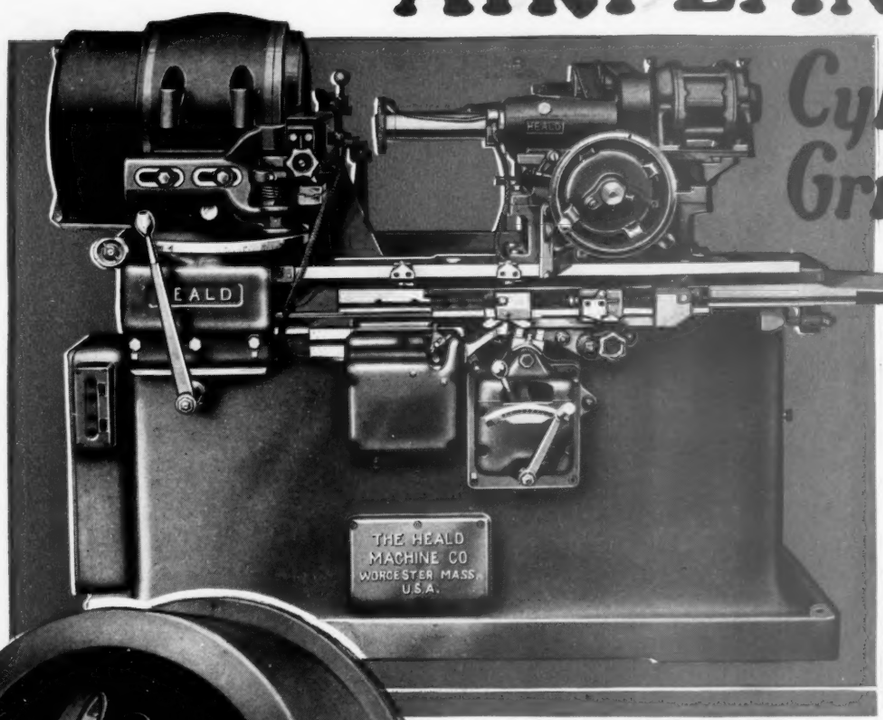
THE *N. A. A.* CONVENTION

THE NEW *Hexhangar*

STARTING THE *All-European* LIGHT PLANE TOUR

AIRPLANE Cylinder Grinder



Used by
Bliss
Continental
Curtiss
Gisholt
Kinner
Lycoming
Pratt & Whitney
Wright
and others

Cylinder as held in the workhead ready for grinding

TEARING off twenty-five thousandths stock from a thin steel airplane cylinder and getting a mirror finish to the closest degree of accuracy is one of the toughest grinding jobs of today. These results are all the more astonishing when one considers it is automatically performed, and previous production figures doubled.

The work is held within the workhead so that the hole is ground absolutely at right angles to the attaching flange and concentric with the outside skirt.

Thus the cylinder, the very heart of the engine, is machined to give as near as possible to 100% efficiency.

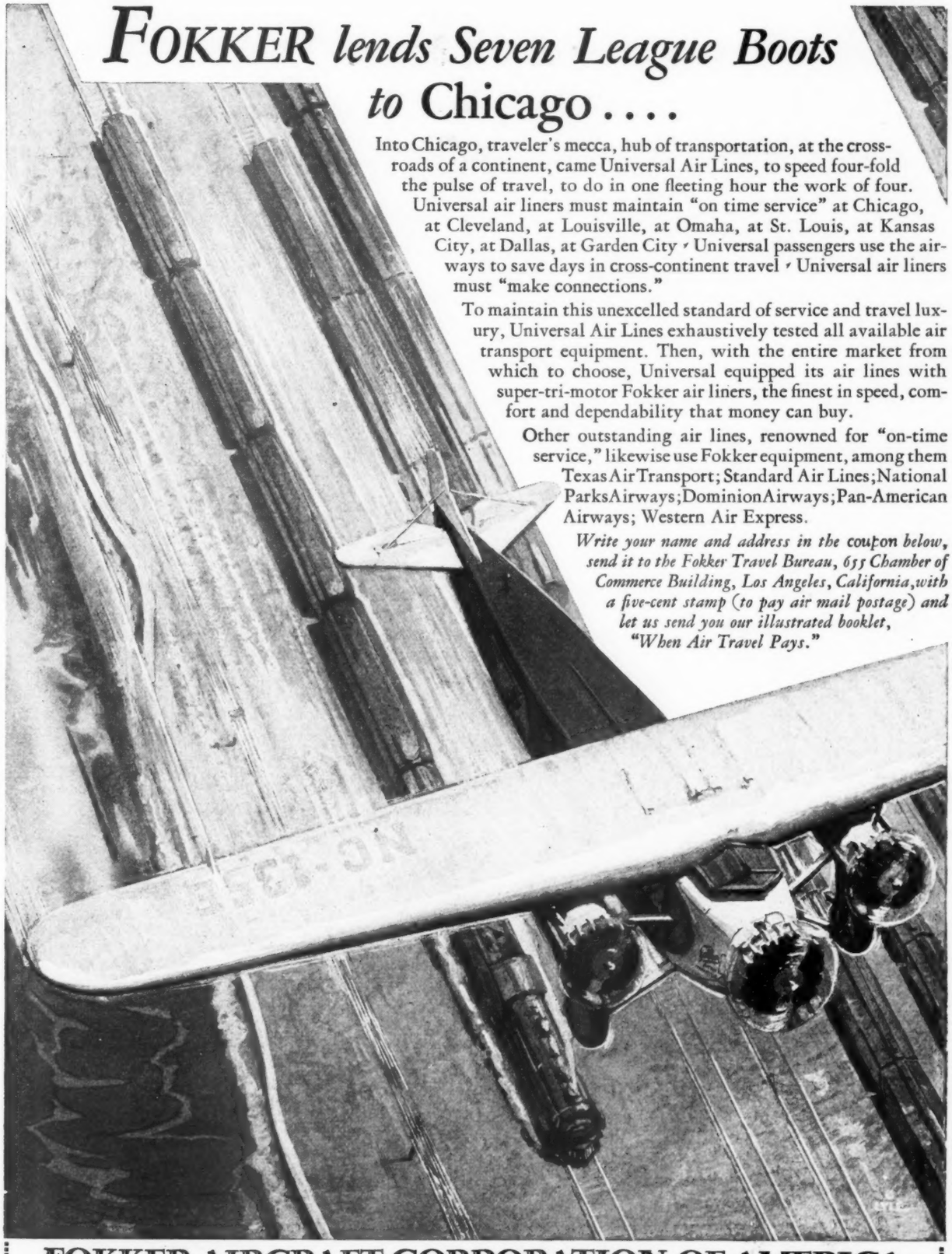
The Heald Machine Co.
Worcester, Mass., U. S. A.

HEALD
Grinding Machines at Cleveland Show
GAGE-MATIC, SIZE-MATIC, 30" SURFACE and AIRPLANE CYLINDER GRINDER

HEALD

AVIATION. September 14, 1929. Vol. No. 27, No. 11. Published weekly. McGraw-Hill Publishing Company, Inc., Tenth Ave. at 36th Street, New York, N. Y. Domestic $4.00 per year; Canada $5.00. All other countries $6.00; 20 cents a copy. Entered as second-class matter July 27, 1928, at the Post Office at New York, N. Y., under the Act of March 3,1879. Printed in U. S. A.

FOKKER lends Seven League Boots to Chicago....



Into Chicago, traveler's mecca, hub of transportation, at the cross-roads of a continent, came Universal Air Lines, to speed four-fold the pulse of travel, to do in one fleeting hour the work of four. Universal air liners must maintain "on time service" at Chicago, at Cleveland, at Louisville, at Omaha, at St. Louis, at Kansas City, at Dallas, at Garden City · Universal passengers use the airways to save days in cross-continent travel · Universal air liners must "make connections."

To maintain this unexcelled standard of service and travel luxury, Universal Air Lines exhaustively tested all available air transport equipment. Then, with the entire market from which to choose, Universal equipped its air lines with super-tri-motor Fokker air liners, the finest in speed, comfort and dependability that money can buy.

Other outstanding air lines, renowned for "on-time service," likewise use Fokker equipment, among them Texas Air Transport; Standard Air Lines; National Parks Airways; Dominion Airways; Pan-American Airways; Western Air Express.

Write your name and address in the coupon below, send it to the Fokker Travel Bureau, 655 Chamber of Commerce Building, Los Angeles, California, with a five-cent stamp (to pay air mail postage) and let us send you our illustrated booklet, "When Air Travel Pays."

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Name.....A

AVIATION'S EYES *are focused on* ST. LOUIS

The Crossroads of the Air

EAST to west, north to south, sweeping diagonally from one corner of the country to another, the natural aerial highways of the nation meet at the "Crossroads of the Air." Here, in the middle of the country, where transportation lines have always met—Aviation, too, has its focal center today.

Toward this mid-continental crossing, Aviation's eyes are gazing now. In and around this natural center must come the great developments of the industry. For, since Aviation is Transportation—fast, long-distance, *straight-line* Transportation—its activity must be greatest where such transportation means the most; where the great air lanes meet, and cross, and radiate.

So, to St. Louis, key city of aerial crossroads, have come one after another of the manufacturers, the transport companies and the service organizations—here to establish their headquarters. Here to St. Louis is coming the National Aircraft Exposition of 1930, the most important Aviation event of the year. Here, too, will come more and more of Aviation's business and manufacturing interests, as the locational advantages of Aviation's Natural Center become better known and understood.

Condensed, accurate facts regarding Aviation opportunities in the St. Louis District, and a special survey, if desired, are available on application to

The INDUSTRIAL BUREAU *of the* INDUSTRIAL CLUB
511 Locust Street St Louis, Mo.

"Shipments F. A. St. L."
(Flyaway, St. Louis) means arrival at destination within 5 hours anywhere inside the 500-mile St. Louis Circle, whose population exceeds 50,000,000 people.

In St. Louis
1929 Gordon Bennett Balloon Races
1930 National Aircraft Show

THE WORLD'S ENDURANCE RECORD
broken at St. Louis, by Jackson and O'Brine, again demonstrates the superior flying weather in this area, which so contribute to make this the natural Center of Aviation.

The CROSSROADS OF THE AIR

These BUILDERS ARE DEMONSTRATING *Axelson* ENGINES

TRAVEL AIR

AMERICAN EAGLE

COMMAND-AIRE

BOEING

LINCOLN PAGE

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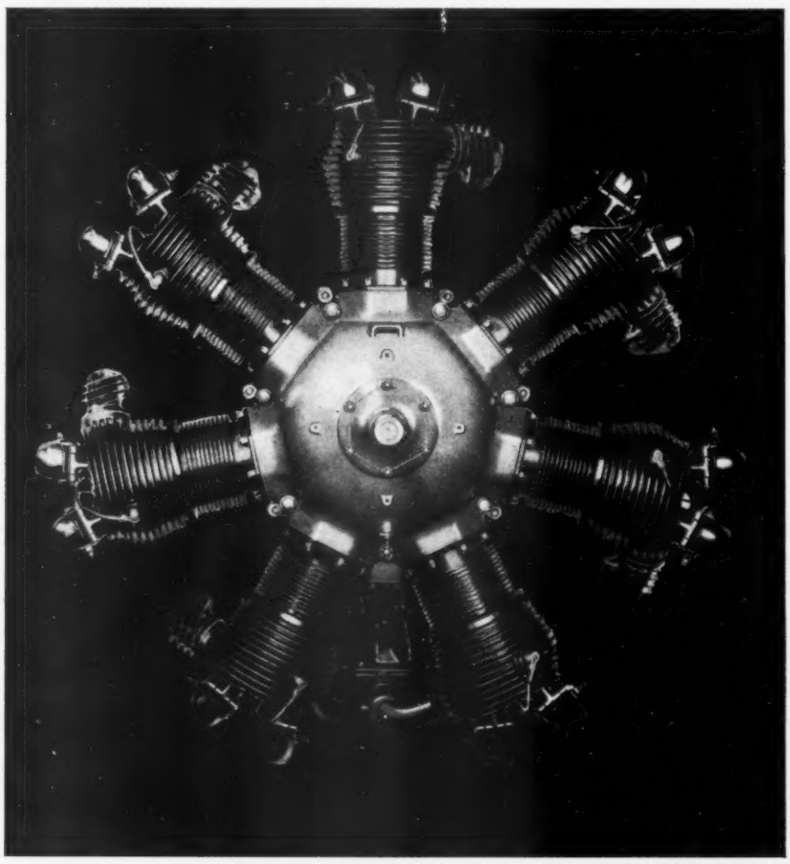
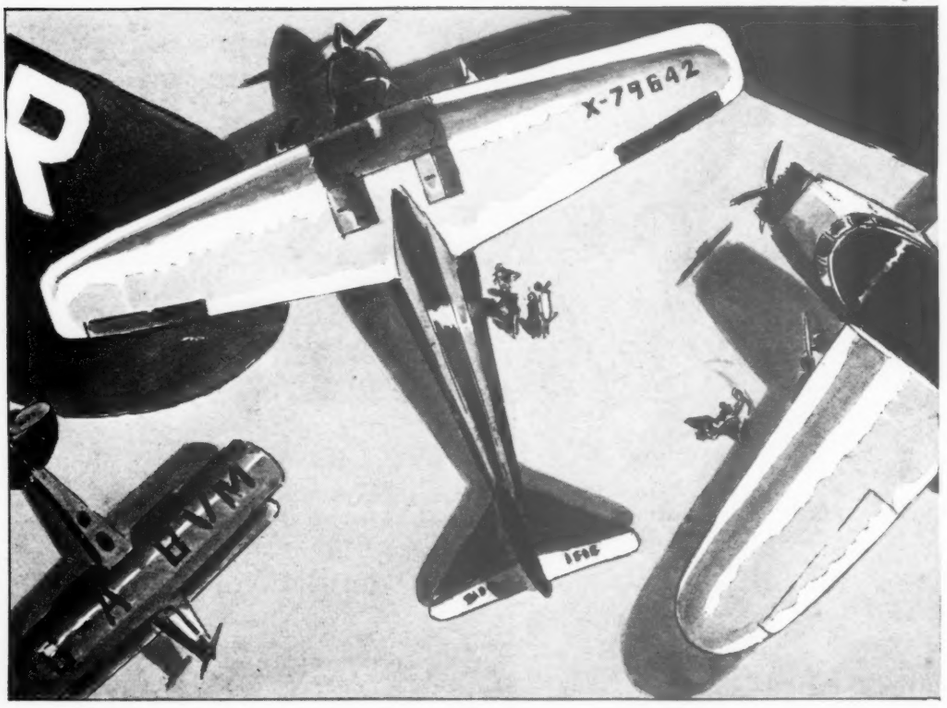


Now the improved Axelson Airplane Engine is ready for inspection in the finer planes—an engine with all the speed you want, unexcelled in reserve power. The fleetest planes are being demonstrated with the Axelson. It represents tomorrow's standards—positive lubrication to every moving part, rigid construction, uniform valve clearance regardless of heat expansion—and many other features. A new booklet describing this improved engine is now ready for distribution. Ask for a copy.

Axelson Aircraft Engine Co.
Factory and General Offices
Corner Randolph St. and Boyle Ave.
Los Angeles, California
(P. O. Box 337)



Finishes, fabrics and other du Pont aircraft materials offer unlimited opportunities for the originality now so necessary in airplane styling.

Flashing Bodies—Luxurious Interiors

TODAY aircraft makers place new responsibilities on the manufacturer. Commercial air transportation calls for added passenger comfort. Not only must your ships progress in mechanical design—but now, they must also constantly improve in luxury and styling.

To manufacturers of aeroplanes, du Pont offers a complete line of aircraft finishes developed to meet these present-day demands. Beautiful in texture, ultra-modern in tone and color, and specially formulated for air service—they bring you significant advantages in competitive selling.

Your whole finishing schedule can be based on these scientific du Pont materials. Wing dopes, Primers, Aircraft Enamels, Army and Navy Finishing materials and many other products are available in their highest stage of modern development.

And du Pont color experts will gladly cooperate with you in planning up-to-the-minute color schemes. The du Pont Color Advisory Service is in constant touch with aircraft styling in both America and Europe. Feel free to call on them for any advice or assistance.

Complete information on any du Pont product for airplane use will be furnished either by mail or by a qualified representative.

AIR-TESTED FINISHES

Du Pont Dopes—The du Pont line of aircraft finishing materials includes clear, semi-pigmented and pigmented dopes. They are all tested formulas of remarkable durability—proven in service as well as in the laboratory. Flexible and highly blush-resistant, the Army and the Navy have approved these products for their requirements. Available in a wide variety of highly visible colors.

Du Pont Paints and Varnishes—Du Pont chemists have developed a complete line of paints and varnishes including Dopeproof Paint, Spar Varnishes, Fuselage Varnish and Aircraft Enamels.

DU PONT
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E. I. DU PONT DE NEMOURS & CO., Inc.

Industrial Finishes Division, Parlin, N. J.

2100 Elston Ave., Chicago, Ill. 351 California St., San Francisco, Cal.

Flint Paint and Varnish Limited, Toronto, Ontario, Canada

MEMBER OF AERONAUTICAL

Distinctive luxuries, added comforts, now made possible by du Pont Pyralin and Fabrikoid—two materials uniquely suited to air service.

—*Modern Styling that* SELLS *Aircraft*

PRACTICAL refinements in cabin design and styling lend inestimable assistance in selling to the modern market. Generous windows, smart accessories, rich upholstery—color, life and comfort everywhere—are essential in the modern plane, just as in the modern motor car.

In the styling of modern planes, du Pont Pyralin and Fabrikoid offer almost unlimited possibilities. Extremely light, ideally durable, and beautiful in the most modern sense, these materials fulfill every requirement of air service.

Pyralin in various colors and effects provides transparent cabin windows, instrument boards and wing lights of smart appearance and utmost serviceability. Complete information and its many present uses will be furnished on request.

Fabrikoid completely modernizes cabin linings and upholstery. Its lightness and toughness make it highly practical for the air. And the designs of the new Nemoursa Aeroplane Fabrics express vividly the buoyancy and gaiety appropriate to modern air transportation.

Du Pont technical men will gladly cooperate in applying these materials to style your planes. Please write direct to the division concerned.

AIR-TESTED MATERIALS

Du Pont Fabrikoid—Sturdy Fabrikoid is an ideal material for open cockpit upholstery. Will withstand varying weather conditions. "Nemoursa Aeroplane Fabrics" are new type, light-weight materials developed for interior trims of cabin ships. Made on a high-grade woven cotton base and treated with appropriate pyroxylin colors. Embossed in distinctive patterns.

Du Pont Pyralin—A strong, durable, light, unbreakable, transparent material furnished in any gauge from 5-1000 upward in sheets approximately 20 in. x 50 in. Ideal for windshields, cabin windows, running lights and other uses.

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C H A M B E R O F C O M M E R C E

C.W. "SPEED" HOLMAN

FIRST *with* NATURALINE

in the Gardner Cup Race *May 31st*

1st

Flying a Laird, powered with a T-4 Wright Whirlwind motor and fueled with NATURALINE, "Speed" Holman flew the 468 miles to Indianapolis and return, in 2 hours, 58 minutes and 40 seconds — an average speed of 156 miles per hour.

"I opened the throttle wide," "Speed" said, "and kept her there all the way."

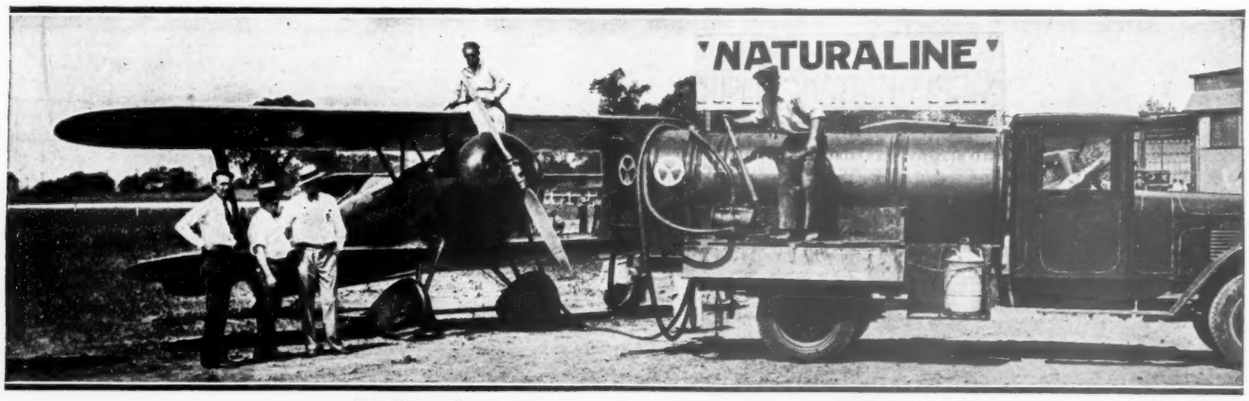
Mr. Holman, who is operating manager of the Northwest Airways, St. Paul, Minnesota, made a test with NATURALINE shortly before he entered the race and stated that it reved up his Hornet engine at least 60 R.P.M. And after the race he remarked that he believed NATURALINE was "the finest fuel available for aviation purposes at this time."

NATUR

Fueling "Speed" Holman's Laird

Mr. E. Roy Alexander, Race Manager, wired us after the race as follows:

GARDNER TROPHY RACE TODAY STOP NINE SHIPS STARTED FIVE FUELED WITH NATURALINE WINNING FIRST SECOND THIRD AND FOURTH PLACE STOP FIFTH SHIP FUELED WITH NATURALINE DOWN DUE TO FABRIC BLOWN OFF FUSELAGE STOP GREAT VICTORY FOR WONDERFUL FUEL CONGRATULATIONS.



Product of
NATURALINE COMPANY OF AMERICA
Chestnut & Smith Building
TULSA, OKLA.

SYDNOR HALL
SECOND *with* NATURALINE

Sydnor Hall flew a Travelair, powered with a T-5 and fueled with NATURALINE. He dived onto the Parks airfield seventeen minutes after "Speed."

Mr. Hall also, was enthusiastic about NATURALINE. After the race in a letter to us he said, "I believe that this gasoline is the best gasoline made for aeroplanes at the present time. I particularly wish to emphasize the fact that NATURALINE is condsiderably lighter than the average and therefore should be especially adaptable for aeroplanes in which a minimum of weight is desirable."

Close upon Sydnor Hall's heels came Arthur J. Davis, flying a Waco powered with a T-5 Whirlwind and fueled with NATURALINE.

2nd

A L I N E

ART DAVIS
THIRD *with* NATURALINE

Then came John P. Wood two minutes later, in a Waco T-4, also fueled with NATURALINE.

A fifth plane fueled with NATURALINE, was forced down because the fabric was torn from the fuselage, forty miles from the finish. This was Irvin T. O'Dell's Cessna. Mr. O'Dell was in second place when the accident happened.

Five out of nine planes were fueled with NATURALINE, four of which took the leading places.

3rd

Fueling Sydnor Hall's Travelair

Pictures show the fueling of the different planes with NATURALINE

Fueling Art Davis' Waco

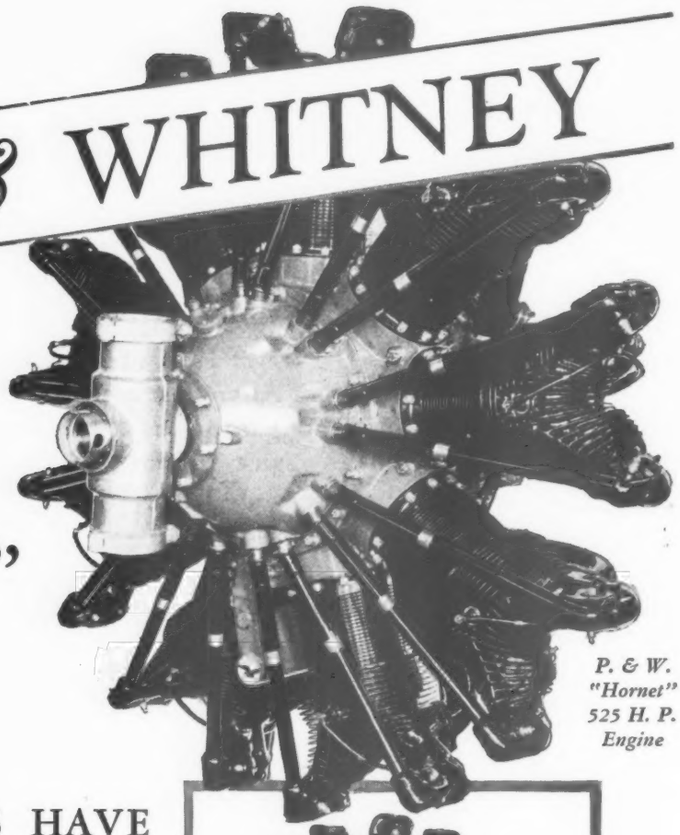
PRATT & WHITNEY

PRATT & WHITNEY, U.S.A. DEPENDABLE ENGINES

"HORNET"

and

"WASP"



P. & W. "Hornet" 525 H. P. Engine

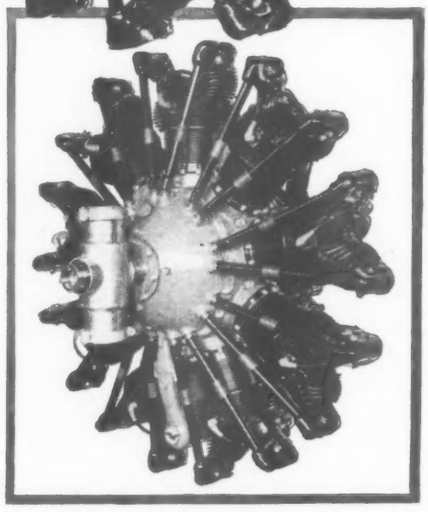
AERONAUTICAL ENGINES HAVE

SRB BALL BEARINGS

As Standard Equipment at Important Points

SRB Ball Bearings have contributed their unexcelled ruggedness and reliability to every performance, altitude and speed record made by Pratt & Whitney "**HORNET**" and "**WASP**" Engines.

Such is the faith placed by Pratt & Whitney engineers in SRB Ball Bearings and the experience and reputation of the organization behind them. For the same reason, you will find the SRB product in other world-famous aviation engines including Wright, Curtiss, Warner, Le Blond, Velie, and others.



P. & W. "Wasp" 420 H. P. Engine

STANDARD STEEL AND BEARINGS INCORPORATED
Plainville DIVISION OF MARLIN-ROCKWELL CORPORATION *Connecticut*

Ball SRB Bearings

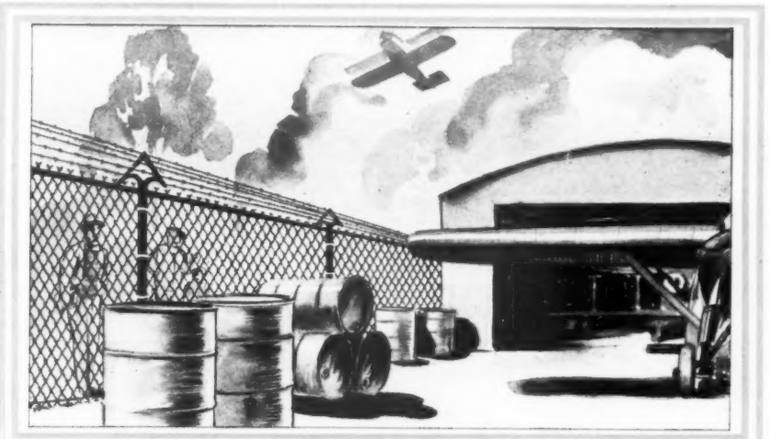
PACIFIC COAST DISTRIBUTORS—F. M. Cobbledick Co., *San Francisco, Cal.* E. D. Maltby Co., *Los Angeles, Cal.* Northwest Bearings Co., *Seattle, Wash.*

Get these Profits *from* Protection

Landing fields clear for landing. Thoughtless children and careless grownups can be kept off landing fields by a sturdy barrier of Page Fence. No need for pilots to risk "crack up" to avoid pedestrians.

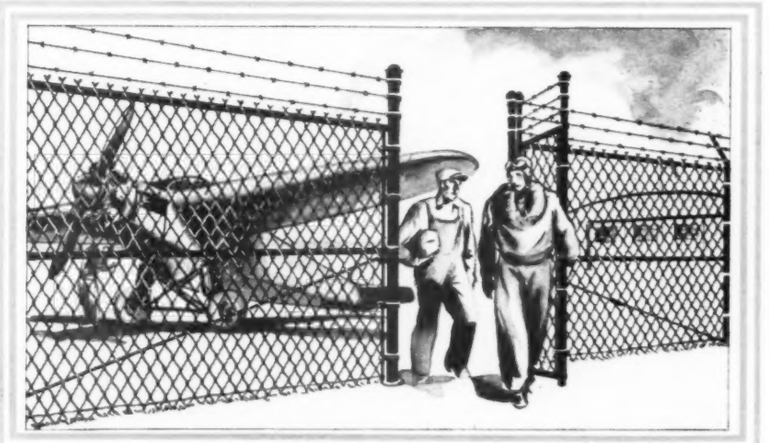
Planes and supplies protected

It is essential for safety that planes be accessible to only mechanics and pilots. You can have complete protection for your planes with Page Fence—ends pilfering of supplies and materials.



One way IN or OUT—for EVERYONE

Page protection for aviation fields proves a definite check on both employees and the public. One way in or out promotes order — simplifies discipline—and gives a positive control on equipment and material.



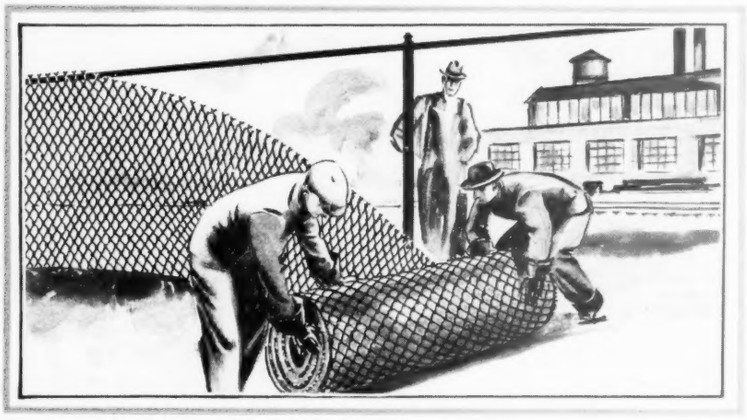
—on the next page read about Page Fence Association plan service

Let the Page Fence Association Serve You in Planning Protection

NOW!

Near you is a member of the Page Fence Association—a group of fence experts ready to give you full advantage of 46 years' Page experience and the 53 Service Organizations that form the Association. Anyone interested in better property protection will want the information available through the Association. Your name and address bring it. There is no obligation.

Experts on protection give individual assistance



There are two essentials to lasting fence service—

1. Good material
2. Expert erection

The Page Fence Association assures erection service by crews trained to meet LOCAL conditions.

Trained erection crews assure lasting service

America's Wire Fence

STEEL AND WIRE PAGE QUALITY PRODUCTS

First Since 1883

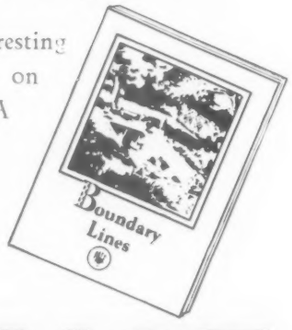
Local Organizations that depend on YOUR satisfaction

The Page Fence Association member who serves you has a business centered right in your locality. They know that you, as a satisfied customer, are the best advertisement they can have for their business.

This PROTECTION plan book is yours—no obligation

"Boundary Lines" is an interesting book full of valuable facts on boundary line protection. A copy is yours for the asking.

Write the Page Fence Association, 520 No. Michigan Avenue, Chicago, Illinois.



***Investigate!**

Page Fabric available in Copperweld non-rusting wire—no upkeep—life-time service.

PAGE CHAIN LINK FENCE

Galvanized or Copperweld
Ornamental Wrought Iron

Copyright 1929, Page Fence Association, Chicago, Ill.

Vancouver to Mexico at 100 Miles an Hour!—Gas $22.50

The landing at Agua Caliente

1350 miles in 13 hours and 7 minutes—in a stock model Great Lakes Sport Trainer—Tex Rankin at the controls—take off at Vancouver—south over the United States—landing in Agua Caliente, Mexico the same day—no stops—only 75 gallons of gas—that's Performance!

Exact counterparts of this marvelous ship are now being produced in volume—engineered to the highest quality standards.

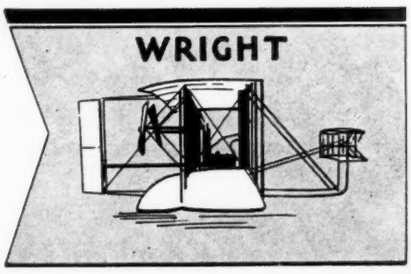
The Great Lakes Sport Trainer is the outstanding value in the light airplane field. Write for new illustrated booklet and complete details.

Tex as he finished his record-breaking flight

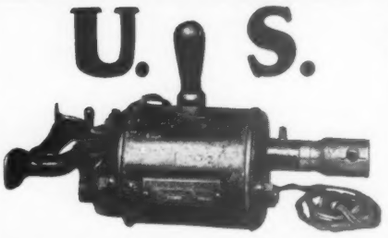
Tex is congratulated by the Mexican chief of police

The official check up

GREAT LAKES AIRCRAFT
CORPORATION CLEVELAND



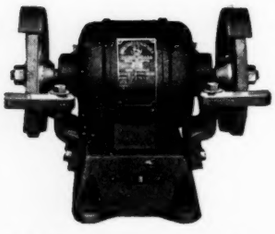
U. S.



FIRST

U. S.
¼" Heavy Duty Drill
2000 R.P.M. Load Speed

$44



U. S. 6" Bench Grinder
3450 R.P.M. Load Speed

$34.50

U. S. ¼" Special Drill
2000 R.P.M. Load Speed

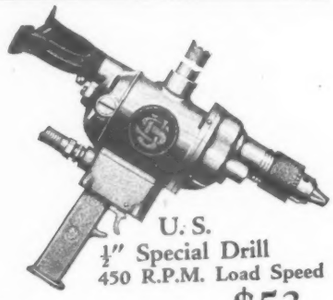
$24

It's easy enough to copy—and copying is all right. But the real test of genuine mechanical ability is to originate, and to improve.

The same ability and experience that conceived the world's first portable electric drill and electric grinder over thirty years ago, has been built into every item in the U. S. line ever since. And today, even the same inventor is *out in the U. S. shops* experimenting, testing, improving—keeping U. S. "the standard of quality."

The U. S. line of portable electric drills, grinders, buffers, etc. is broadest of all in its field. Whatever you need, FIRST try U. S. Then you can count on having the finest of its kind in your shop.

Ask Your Jobber
or Write Us

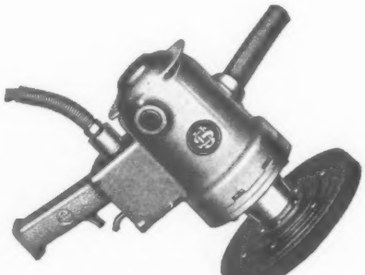


U. S.
½" Special Drill
450 R.P.M. Load Speed

$53

$150
(½ H.P.)

U. S. Combination
Grinder-Reamer Drive



U. S. Disc Sander
2700 R.P.M. Load Speed

$85

THE UNITED STATES ELECTRICAL TOOL COMPANY

Oldest Builders of Electrical Drills and Grinders in the World

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Export Sales Representatives—WESTINGHOUSE ELECTRIC INTERNATIONAL CO.—150 Broadway, New York City

Every Parks-Trained Transport Pilot *is in a well-paying position today*

Aviation Has Plenty of Money, But Not Nearly Enough Skilled Flyers

So serious is the shortage of Licensed Transport Pilots that every man trained for this work at Parks Air College is working right now and being paid big money for his skill.

This shortage of Transport Pilots is getting more acute. Factories are making planes and the public is buying them faster than pilots can be trained. Students more and more are finding themselves stepping almost automatically into positions paying upwards of $3,600 a year—more than the cost of the complete course—as soon as they receive their Transport Pilot credentials.

Nowhere can you get these credentials any more quickly, or more certainly, than at Parks Air College, the biggest and finest flying school in America, the school that got transport approval from the United States Department of Commerce without a moment's preparation for examinations.

Parks-Trained Pilots Preferred Where Others Must Wait

So widespread is this school's reputation for high standards and absolute thoroughness of training methods that its graduates quickly discover that Parks-trained pilots are preferred.

Leaders in aviation, one of the richest of modern industries, know Parks Air College like a book. They know it to be modern and complete in the most trifling details. They know of its staff of long-experienced pilot-instructors, none of whom has less than 1,000 hours in the air to his credit.

They know that all the school equipment, including the big fleet of open-cockpit and cabin ships, is new and kept up in the best of condition. They know that a man trained at Parks Air College has been TRAINED RIGHT, that he has had the best instruction possible, that he is a man with an assured future in the air.

6,188 New Ships Each Year With Only 4,160 Pilots to Fly Them

The Commerce Department has just announced that new planes are being licensed at the rate of 6,188 a year, new pilots at the rate of 4,160. That means there are only two-thirds as many new pilots as are needed to fly these ships. It means that each year there are 2,028 ships forced to stay on the ground because the highly paid, highly skilled men needed to take them up are lacking. There's opportunity for you!

Get into aviation! It's one of the most fascinating things on earth today. It's chockful of future for men of foresight and, above all else, action. Action is the very backbone of this ever-growing work. Let your first action be the filling in and mailing of the coupon below. Now!

PARKS AIR COLLEGE
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Largest Civilian Air School in America!

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Parks Air College has been rated by the Aeronautics Branch, Department of Commerce, as an Approved Transport Ground and Flying School

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AN EXCERPT FROM THE ABOVE ADVERTISING FOLDER DESCRIBING THE 26 x 2¼" "HARTFORD AEROPLANE" TIRE

"Anticipating the increased size and weight of airships in the near future we have designed this tire for heavier work."

BACK IN 1908 THE U. S. RUBBER CO.

FIRST MANUFACTURED PNEUMATIC AIRPLANE TIRES "TO HELP YOU FLY"

More than 20 years ago, when a 25 mile wind was sufficient to keep the hardiest pilots on the ground — when most planes were launched from special runways and, if lucky, landed on skids of oak or ash . . . that is when the United States Rubber Company demonstrated its faith in flying by designing the first pneumatic tires for aircraft. The first tires to be offered were the 20 x 2" "Hartford Aviators"— purchased by both Wright and Curtiss at the first American Aero Show in 1908.

Heavier tires soon followed and in 1910 there was published an advertising folder which was entitled "To Help you Fly" and which listed three sizes of airplane tires in addition to other flying accessories.

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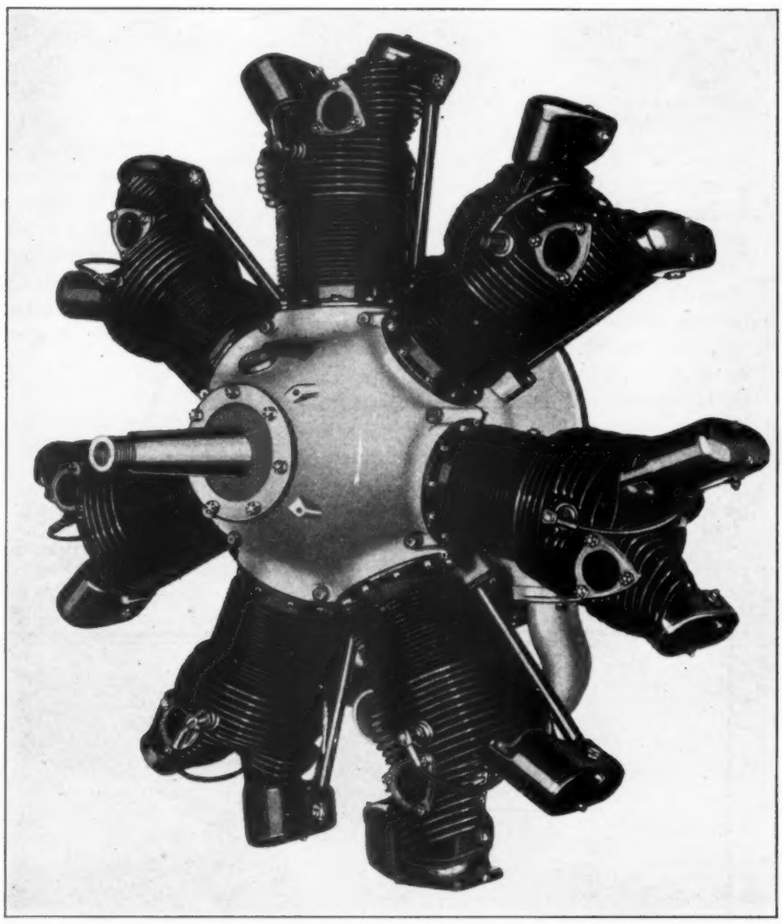

The new 7-cylinder Continental Aircraft Engine, with cylinder barrels made from Bethlehem "Airplane Quality" Steel.

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PERFORMANCE *(Actual)*

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V-3

$2965 Flyaway at field
Complete with LeBlond
60 h.p. Radial Engine

DAVIS MONOPLANE

A TWO-PLACE HIGH-WING MONOPLANE—«THE AMERICAN MOTH»

AVIATION

The Oldest American Aeronautical Magazine

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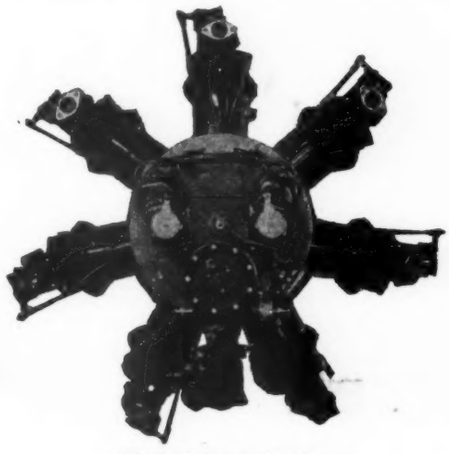

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Continental Engines

AVIATION

THE OLDEST AMERICAN AERONAUTICAL MAGAZINE

A McGRAW-HILL PUBLICATION . . . ESTABLISHED 1916

EDWARD P. WARNER, *Editor*

VOLUME 27 . . . **September 14, 1929** . . . NUMBER 11

On Talking Facts

CONSPICUOUS among the papers presented at the recent joint technical meeting of the Society of Automotive Engineers and the Aeronautical Chamber of Commerce in Cleveland were three which indicate a trend of the times. Three authors quite independently undertook to make economic analyses of problems of airplane design and operation. Laying aside any preconceived prejudices or general impressions, they set out to find the answer by arithmetic.

The practice is a growing one, but it is not growing rapidly enough. Aviation has passed the emotional stage. What we need now is a campaign of fact-finding. Such matters as a choice of the speed at which an airline should operate; the price that can properly be paid for the saving of weight, either in the airplane structure or in the engine; the number of cents per gallon by which we are justified in increasing the sum paid for fuel in order to reduce the consumption by a definite amount or to secure a definite increase in the power output of a given engine; those and many other topics of which they are typical, can finally be solved only with the aid of pencil and paper and slide rule or adding machine. The rôle of judgment based on experience is obviously not to be despised. It is indispensable, but judgment must have some accurately known data to use as an anchor and a foundation for its exercise.

Those engaged in the aeronautical industry, as well as we who are in aeronautical publishing, are enthusiastic about the future of air transport. If we were not we should be in some other business. But enthusiasm is not a substitute for knowledge. To infect the indifferent section of the general public with our own enthusiasm and to inspire them with the desire to take to flying on their own account is very necessary. For our own sake, and in order that we may render the public the best possible service after they have been persuaded to think about taking advantage of it, it is equally important that we give analytical treatment to our problems. Enthusiasm is the driving power behind the aeronautical industry and its progress, but the result of a perfectly coldblooded and hardboiled study of the facts and figures, lead where they will, is the steering gear. The more rapidly such studies multiply, and the more freely the industry as a whole exchanges the information derived from them, the less likely any of us are to waste energy by running off the track.

//

Country Business

FARM RELIEF is more closely allied with the development of aviation than many members of the aernautical profession and most members of the political profession have realized. Farm relief is a phrase and a political issue. No over-night legislation will bring automatic prosperity to the agriculturist. Rather will prosperity, and advancement of farming as an industry, come through the continued application of more efficient production and marketing methods. That means the universal adoption of the most modern machinery and the airplane is probably the most modern of all machines.

Gasoline tractors and mechanical sowing, reaping, binding, and threshing machines have already revolutionized methods of agriculture. The employment of the truck and automobile has greatly simplified marketing problems, making possible wider and more efficient distribution of many crops. The telephone, radio and automobile have drawn the isolated farm closer to our national life, and now the airplane will destroy the last barrier of isolation and bring city and country into close and constant contact. Aircraft are primarily instruments of the wider spaces. Men mass in cities for more rapid communication and mutual co-operation. The airplane will bring those benefits to men whose daily activities demand that they live at greater distances apart.

One western produce buyer now habitually flies directly to the ranches with which he does business. In one day he has made personal visits to and purchases

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from ranches in the Imperial Valley of Southern California and the San Joaquin Valley of Northern California, situated hundreds of miles apart, accomplishing alone and giving personal supervision to work which would have required the attention of several men without the airplane.

Crop marketing is one phase of the airplane's possibilities. Others, such as crop dusting, sowing, crop inspection, and general transportation over a large ranch or series of ranches have been recognized for some time. Further possibilities arise almost daily.

Whereas the city dweller will prove the great source of traffic over established inter-city air transport lines, it is to the country dweller that we must look for the immediate use of the small and specialized forms of aircraft. Prosperity for the builders of automobiles has long rested directly on the purchases of the farm population, and the same is likely to prove true for builders of airplanes. Those with their interests centered in a city have neither the room for operation nor the incentive to use small aircraft. Country folk have both, and the intelligent recognition of this fact by the American aircraft industry will be a leading factor in assuring the continued growth of the figures of airplane production and sales.

//

For the Common Welfare

THE AERONAUTICAL CHAMBER of Commerce has just been meeting in its several sections at Cleveland. Its program of discussion was full to overflowing. Among the subjects on the docket were some that affect vitally every company in the industry, and every individual employee. It is deplorable that so little interest was displayed by a majority of those present in Cleveland. The apparent indifference of a large part of the industry to its collective interests is alarming.

When we find that less than one-third of the commercial airplane manufacturers belonging to the Chamber of Commerce are represented at a meeting called for the express purpose of discussing their problems, we can conceive of two explanations. Some of those who ought to be present are having so much difficulty in keeping up with their own business that they have no possibility of finding time to consider anyone else's troubles or the industry's common problems. Others, among the smaller producers, no doubt feel that the big fellows will reach the decisions and decide the collective policies anyway, and that it would be a waste of time for them to participate or even to attend the discussion.

Both groups are wrong. When a man is so busy with his own affairs that he has no time to consider his relations with the rest of his industry and the rest of the world, trouble lies just over the horizon. There is something wrong with a manufacturing company that cannot find a way to have any one of its principal executives attend a meeting for the discussion of the Department of Commerce regulations under which next year's machines will have to be designed and built. There is something wrong with a manufacturer who does not care to get first-hand information upon a discussion of the standard discounts to be given on purchases of engines, or who does not take pains to have his own views ready for expression.

As for the notion that the small companies have no influence in such a meeting that they might as well stay away, if that be true it is their own fault. The good presentation of a good case counts for as much in a meeting of the aeronautical industry as anywhere else. The decisions finally reached by such gatherings are usually unanimous or nearly so, but agreement comes only as a result of free discussion, and decision cannot be wise unless the discussion is broad and representative.

It may be that there were too many competing attractions at Cleveland, but there was nothing that deserved precedence over the meetings of the Chamber of Commerce. The sessions were intersting and valuable, but that will continue to be true in the future only if the industry makes it so. A large measure of the aircraft industry's future prosperity and of its claim upon the public's confidence will depend upon its demonstrated ability to co-operate. The meetings of the Chamber lay the corner-stone of co-operation. The Chamber is entitled to more than lip service from its members. They owe what a number of them already are freely giving, a real participation in its work. Its meetings must be a genuine forum of the industry's views upon its problems. They must not be allowed to sink into sterile and sparsely attended sessions for the railroading through of prearranged programs.

//

Commercial Helium

AUGUST was the airships' month. The Graf Zeppelin flew around the world, with an extra crossing of the Atlantic thrown in and with another about to be started as the month closed. The metalclad ship from Detroit, the fruit of seven years of study and effort, took the air. The two new British rigids are at last on the point of readiness for trial. The Los Angeles gave the first public demonstration of the process of hooking a plane onto an airship in flight and casting loose again. At the Cleveland Airport, perhaps for the first time in history, four "blimps" maneuvered in formation. After years of doubt and persistent pessimism, the lay public is becoming enthusiastically airship-minded.

That there will be commercial operation of rigid airships no longer admits of challenge. We believe that capital will be forthcoming to support transoceanic operation of lighter-than-air craft. We believe very confidently that our citizens are ready to patronize them. Airships will be designed and built and made ready to be flown, but what are we going to fill them with?

In America that question admits of but one answer. The Zeppelin Company has used hydrogen successfully and with substantial safety for many years, but even the Zeppelin interests are beginning to look with longing eyes upon a non-inflammable gas, and to concede the desirability of making some small sacrifice in lifting power to secure its great advantage in safety. Captain Lehmann, commanding the Graf Zeppelin on its most recent crossing of the Atlantic, has been quoted in the last two weeks as an advocate of helium inflation. Our own experience with that gas has now been broad enough so that no other receives any serious consideration. When to helium inflation we add the installation of Diesel engines, using a fuel not capable of taking fire in ordinary conditions and by any ordinary means, we shall finally subtract fire hazard from airship transport.

Helium it must be, but where shall it come from? The most important field of helium-bearing gas, located in northwestern Texas, is under the control of the Bureau of Mines. The wants of the Army and Navy are supplied, but the Bureau of Mines is hardly likely to go into the business of manufacturing helium for general commercial trade. The Bureau has not, to put it conservatively, given any enthusiastic assistance to commercial companies who are in the field of helium production. Their way could hardly have been made more difficult. If it were not for the Navy Department's awards of commercial contracts for the supply of helium at a time when the Bureau of Mines production was temporarily almost shut down, there would be no commercial industry today, and the Los Angeles would have had to be laid up for a considerable period.

Three years ago, when there was no commercial helium production, it was being generally assumed in Washington that the Government would ultimately withdraw from the business, confining its attention to a continuance of the research work which had already proved so valuable and to the exploration of new fields, and leave routine production to those who would make it a business. Now the beginning of an industry exists, and it is getting very slim encouragement.

The position of three years ago was right. Any attempt, open or covert, direct or indirect, to maintain a Government monopoly in helium production is wrong.

As a matter of general policy, the Government ought not to be in the business of manufacturing any commodity. Helium should be no exception. The stimulation of gas and oil companies to enter the industry, so that there may be not merely one but several producers, with the purchaser's interest protected in the usual fashion by competition, should become a fundamental of our policy. There is nothing more important as a preliminary to putting the airship to work commercially. As a definite step for the immediate future, the War and Navy Departments should make it a rule, even at some temporary increase in cost, to fill at least half their helium demands in the commercial market when gas is available on reasonable terms. To say nothing of the benefit to commercial operations to come, in the long run that will be good government economy.

//

The New Mexico Tragedy

IT IS TOO EARLY to make any technical comments of value on the crash on the slopes of Mount Taylor which cost eight lives last week. That must await the official inquiry, and the collection of further evidence bearing upon first causes. Expressions of sympathy, however, are never premature in such a case, nor are some general observations about the attitude that we should take in the face of misfortune.

Safety has been a great problem—none greater—from the very first days of organized industry and organized transportation. Safety is to be increased, in the air as at sea, or in the factory, only by persistent analysis of the causes both of actual accidents and of theoretically possible accidents, and then by checkmating those causes one by one. For example, the danger of fire in the air or upon crash has not been entirely eliminated, but it has been reduced to a minute fraction of what it was ten years ago as a result of the patient experiment and study carried on during that period by the Army Air Corps at Wright Field and by a British committee on fire hazards. The essential is, then, that no accident should pass unstudied, and that we should extract the last bit of information from each one in order that there may be no recurrence.

When sensational accidents happen the popular reaction often borders on panic. This is the time for us to remind ourselves, and to remind the non-aeronautical public so far as we can, that safety is concerned with averages over a reasonably long term. Air travel is no less safe this week than it was last month. Rather the reverse. It is still true that the hazards of travel on well-managed air lines are, and have been, shown by experience to be, small. No effort will be spared to make them smaller.

To the relatives and friends of the crew and passengers of the City of San Francisco, and to the officials of Transcontinental Air Transport, to whom safety has been the object of constant thought and care, it would be impertinent to speak of consolation. We can only, and we do, offer our very profound sympathy to all concerned.

ONE AND ONE-HALF ACRES OF Hangar Floor UNDER

By CHARLES F. MCREYNOLDS

REVOLUTIONARY in design and of massive size, the all-steel-and-concrete hexagon-shaped Hexhangar recently erected on the new Los Angeles terminal field of Western Air Express, Inc., marks the first big step in a definite trend toward the development of airport buildings designed to meet the complex needs of air line operators. Rail lines have developed their "round houses," steamship lines their floating dry docks, and bus operators their special service pits for overhaul and servicing of equipment, but up to the time that the "Hexhangar" was conceived and built by the William Eaves Company, most air lines had been content with large rectangular structures not far removed from the barns and sheds which cradled much of aviation's early development.

Containing 54,400 sq.ft., or an acre and a half of floor space under one roof, the Western Air Express Hexhangar was designed to simultaneously service six of the 32-passenger, four-engined DT series Fokkers soon to be placed in operation. This giant building is 286 ft. in diameter, and has six sides, each measuring 143 ft. with an unobstructed door opening 123 ft. by 20 ft. high. Each of the six sections of the building is an equilateral triangle 143 ft. on a side, and the entire building will house either six DT Fokkers, 18 F-10 Fokkers, or 54 Boeing or Douglas mail planes all at one time, and if necessary many small planes can be stored in the hangar along with the six DT's.

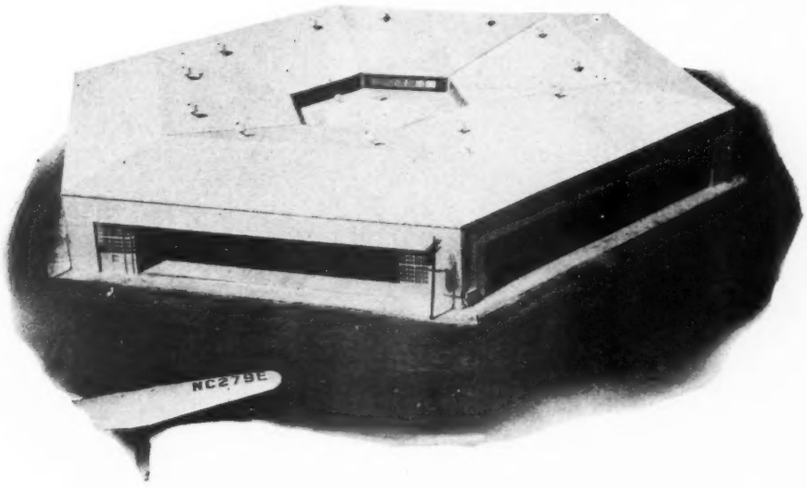
Some conception of the size of this hangar is given by the statement that there are 275 tons of structural steel, more than 52 tons of corrugated iron sheeting, and 1,500 yd. of concrete used in its construction, the total cost of the building being $91,000 or $1.69 per sq.ft. of floor area. Not one stick of wood is used in the structure anywhere.

WHEN Western Air Express, Inc., recently decided to abandon Vail field and construct an entirely new terminal on a site near Alhambra, C. C. Cole superintendent of operations for all Western Air Express lines suggested that a special service hangar be developed for the new field. William Eaves, president of the William Eaves Construction Company and a leading Southern California contractor, conceived the idea of grouping the planes to be served about a central control point. Following this idea the design for the Hexhangar building was developed by A. M. Edleman and A. C. Zimmerman, associated archi-

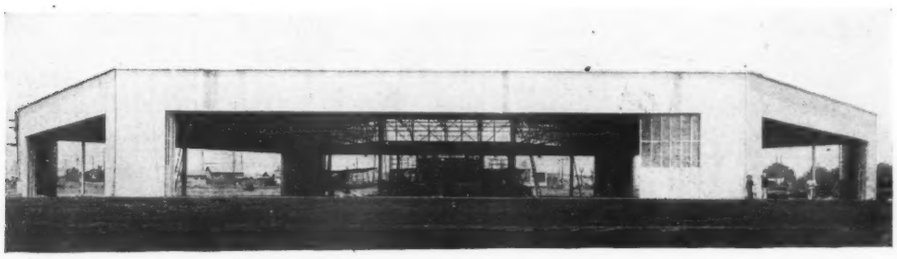
"Hexhangar" erected at the Los Angeles terminal field for Western Air Express by William Eaves Company

Space

ONE ROOF



tects, and the contract for this hangar and the complete development of the field was awarded to the William Eaves Company. This company has now applied for basic patents on the Hexhangar and is specializing on airport design and airport building construction. Wide interest has been aroused in the new type hangar, both in this country and abroad, and more buildings of this type will probably be erected on other airports under development.



Exterior view of the completed hangar showing wide door-space on all sides

In developing this hangar it was considered that the proper shape for a unit within which but one plane is to be housed is a triangle, because of the proportions which are common to all airplanes. At least for servicing it seemed desirable to group these triangular units about a central point in order to simplify handling of supplies and the direction of working personnel. Eight units, or a hangar of octagon shape, were first considered, but it was found that much space would be wasted in the octagon type because the section sides would be longer than the door openings, whereas all commercial planes have a greater wing span than fuselage length. A pentagon, or five-sided figure seemed ideal from the standpoint of area per plane housed, but this shape was abandoned in favor of the hexagon because of the symmetry of a hexagon which makes it cheaper to build, easier to brace, able to handle one more plane with little sacrifice in added building cost, and too, because the hex building is easier to place and better looking.

Because of the interlocking structure resulting from supporting a symmetrical hexagon shaped roof it is possible to use considerably lighter steel throughout than in the conventional type building and at the same time a more unobstructed floor is obtained with roof girders of shorter span, the longest main girder in the Hexhangar being 82 ft. This type of structure is naturally well braced, particularly against violent winds, and the shape of the building reduces wind hazard because there are no sharp corners or large blank walls to catch the wind.

Each of the six sides of the Hexhangar is chiefly occupied by a 120 ft. door opening, which is fitted with Fenestra aircraft hangar doors in ten 10-ft. units and two 13-ft. units, rolling each way to a blank wall so as to permit all doors to be open at the same time without interfering with each other. Two of the units have small pilot doors in them for the use of persons entering or leaving the hangar when all doors are closed. Although the doors may be quickly handled by attendants, electrical equipment is being installed which will make possible the throwing open of all six doors simultaneously by operating one switch on the central control panel. Approximately two-thirds of each door is devoted to window glass, there being a total of 6,300 panes of Solite obscure prism glass in the entire building, 4,300 panes in the doors alone and a total window space of 4,076 sq.ft. All door units are equipped with rubber weather strips to completely seal the hangar against weather with the doors closed.

THE CONCRETE FLOOR of the hangar has a slope of 15 in. from center to circumference, making it possible for one man to roll the largest planes out of the hangar by gravity in an emergency. All covering on roof and sides is with copper bearing galvanized corrugated iron sheeting. The roof is so constructed that 60 per cent of all water falling on it drains to the center and down to an outlet beneath the hangar floor.

Centralization of all units, accessories, storage, etc., is the chief feature of the hangar. In keeping with this idea there is a hexagon shaped building in the center, 40 ft.

in diameter, one-third of which is occupied by lavatory and locker rooms, and two-thirds by a stock room. Above this stock room building is a mezzanine floor reached by a circular staircase, on which is located the office of the building and an observation platform running completely around this office for the use of the shop superintendent in supervising service operations. In this central building an electric panel is located which controls all lights or electric motors in the building. Installation of plumbing fixtures and electrical equipment is greatly simplified by the manner in which all pipes and conduits are extended from one point. In each of the six sections of the hangar there is a small service pit containing air, water, and electric power outlets; gas, water, air, and electric outlets are also provided from each of the six main control pillars which are located 20 ft. out from the central building.

ONE OF the chief features of the hangar roof is an 8-ft. drop center 80 ft. in diameter just above the central office and service building. This provides vertical windows all the way around the center of the hangar above the 20 ft. level, thus flooding the interior of the building with indirect light. Skylights are also installed above each work bench and above the central office. The vertical center windows are of ventilating type and in addition there are twelve 24-in. Robertson ventilators located in the roof as protection against gas fumes. Six red obstruction lights are mounted along the outside diameter of the hangar roof and six beacon lights are mounted, one on each point of the roof. In addition there are six floodlights on the ground which light the building at night to render it more clearly visible from the air. As a further aid to visibility the entire hangar, roof, doors and walls, is being painted with 15-ft. orange and black squares.

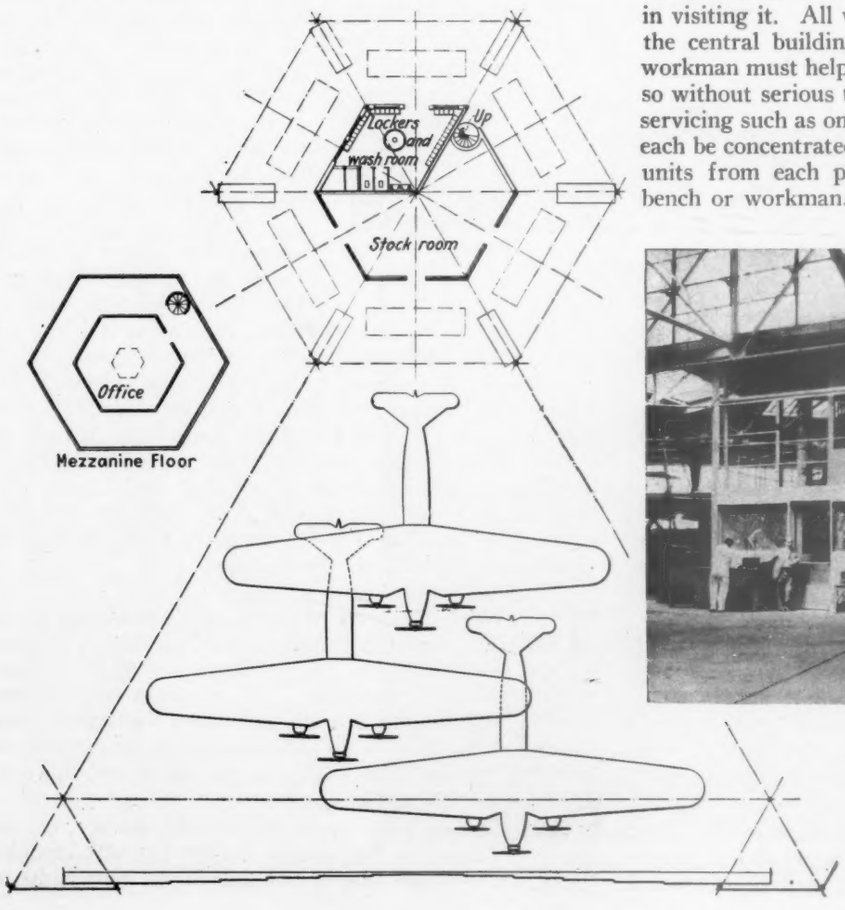
Outside painting is by Hill-Hubbell's Monolithic cement paint, which is waterproof and impervious to the weather. The entire hangar interior is heavily sprayed with aluminum paint for weather protection and better lighting.

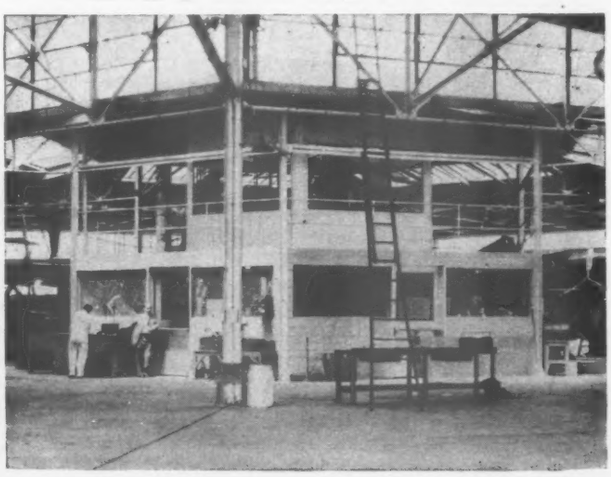
Complete Foamite fire fighting equipment is installed, an exterior pressure tank being connected to a number of outlets within the building, to any of which a hose may be attached for reaching the fire area.

During construction of a storage hangar the Western Air Express is using the Hexhangar for both storage and service. Just as soon as possible, however, it will be cleared of everything but service equipment. The plan calls for every Western Air Express plane to go through the service hangar into storage after each run. The storage hangar is of triangle unit construction, consisting of six units staggered to give a building of parallelogram form with three planes occupying stalls on each side of the building.

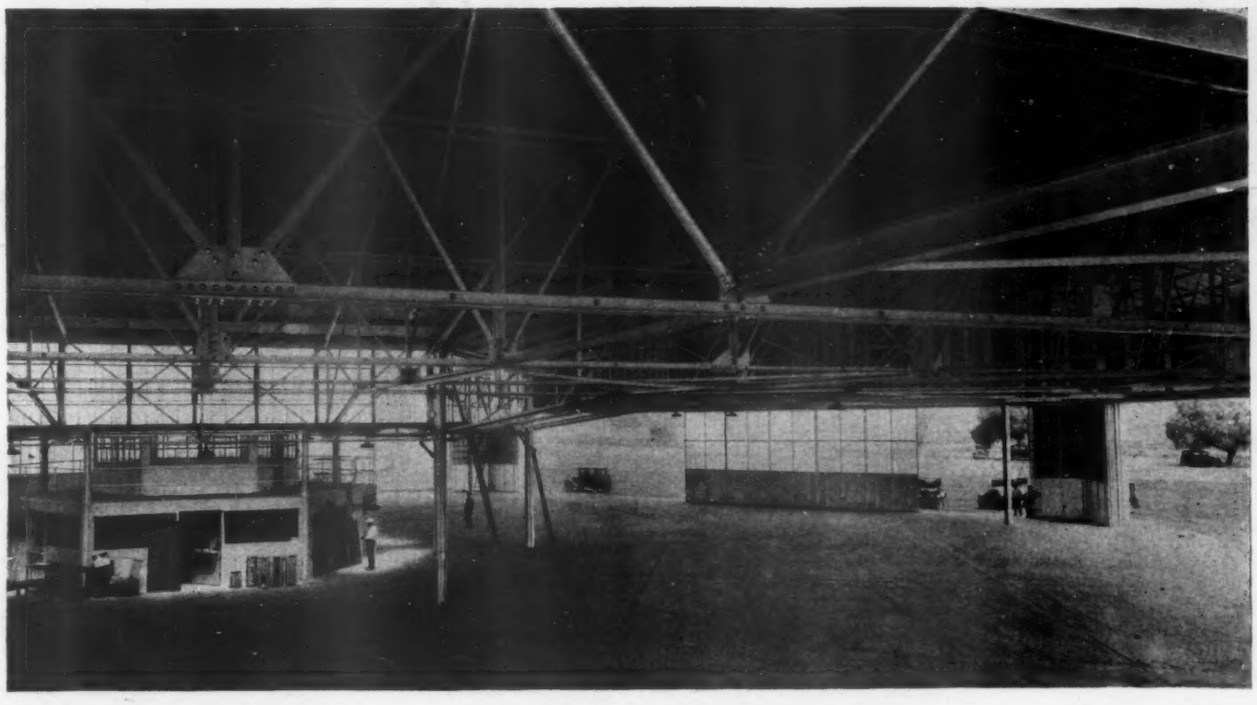
MANY ECONOMIES in servicing result from the hexagon hangar. Most important is that the superintendent is close to all work being done, and can supervise all operations wtihout leaving his second story office.

Next in importance is the fact that all supplies and tools are equidistant from all work, each man having a minimum distance to walk for the needed tool, where in the ordinary type hangar he might walk three times as far, which when repeated many times daily adds greatly to labor cost. Another important item is that the wash room is close at hand and the minimum of time is lost in visiting it. All work benches are concentrated around the central building and it is apparent that where one workman must help another or ask advice, he can easily do so without serious time loss. Another factor is that subservicing such as on batteries, magnetos, welding, etc., can each be concentrated at a separate bench to advantage and units from each plane may be brought to that special bench or workman. It is also possible to specialize cer-

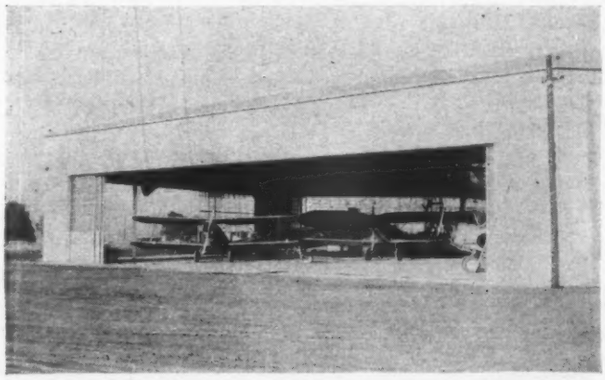




Above: Stock room in the center of the hangar. Left: Ground plan, with projection showing accommodation for three transport planes in each section



Above: Interior view showing the method of telescoping doors, and the large amount of window space in doors when closed. Below: Exterior view showing position of planes in one section of the hangar



tain service operations in certain segments of the hangar as for instance in the present hangar one section is equipped with an overhead walkway and water outlet which permits a worker to wash the entire upper portion of the plane's wing by using the long handled water brush operated from along the walkway.

A DECIDED ADVANTAGE to conducting service operations only in one hangar and in having a separate building for engine overhaul or wing and fuselage repair, is found in the fact that the service building can be equipped with many special stands used in servicing which would be in the way for any other operation. Also, more complete mechanical service requires many special tools which are best kept in a separate shop. In the near future a separate wing and engine repair shop building will be erected adjoining the present service hangar.

The hexagon shaped service hangar provides just the right sort of odd corners for placing of benches, and supplies, where they will not be in the way as is often the case with the rectangular hangar.

The shape and arrangement of the hexhangar permit tractors to tow planes into the hangar and then to proceed on out by means of a center alleyway without difficulty. The approximately circular shape also permits placing the hangar in odd corners of landing fields, which are always present when cross runways are laid out on rectangular fields. In fact, from the servicing angle, there seem to be so many advantages to the hexagon or circular type of hangar that that form of building is sure to be very carefully studied by air line officials.

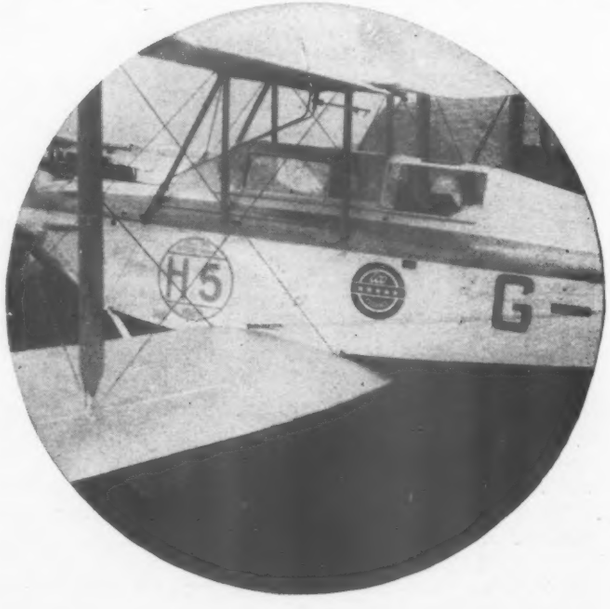
For installation on a private or mixed commercial field there is much in favor of the Hexhangar also. By partitioning off each segment of the hangar it is possible to rent at least as cheaply per plane as space can be rented in any other hangar, plus the advantages to the private owner of having a centrally located wash room and a central parts and supply room, perhaps operated by a separate company, which would efficiently supply all hangar tenants. From the storage standpoint, the outstanding characteristic of the Hexhangar is the accessibility which it provides, making it possible to move any plane without moving any other; something that is impossible in the conventional type hangar.

Considering all of the advantages made available by the hexagon type of construction a comparison of costs as against less permanent types is of unusual interest. The officials of the William Eaves Construction Company do not believe it possible to erect the ordinary first-class hangar of wood construction for much under $1.20 per square foot of hangar floor area according to figures recently published, while the Hexhangar built for the Western Air Express, with complete equipment and the finest construction and finish that could be desired, was erected at a cost of $1.69 per square foot. Figuring depreciation over a period of years, they consider that steel and concrete construction must be granted to be the cheapest, to say nothing of lowered fire hazard and increased efficiency of the building.

STARTING THE All-European LIGHT

By EARL D. OSBORN

Above: A group of Italian Bredas about to start the race.
Below: Capt. Broad ready to take off in his coupe Moth



OFFICIALS who think that there are difficulties in connection with running the Ford Reliability Tour will appreciate the amount of organization necessary to run the Challenge International de Tourism. The tour, which this year was conducted by the Aero Club of France, started from Orly, near Paris, carried the contestants on a 3,907-mi. trip through twelve different countries, each with its own customs and language. Originally there were 88 applicants for entry from ten different countries. Any tour is difficult to manage, but under such circumstance the effort is little short of stupendous.

This international light plane tour is very direct evidence of the increasing importance which Europe is placing on the development of the light plane. Last year no country except England had adequate light planes; and the tour itself did not go outside of France. Also there were many less entrants. However, it is being more and more realized by the various countries, that the cheapest and most practical way of having a reserve of military fliers is to encourage the development of private flying. The fact that these planes, which are the result of government encouragement for military purposes rather than of commercial demand, should be competing in more or less friendly rivalry, brings out clearly the international fraternal aspects of aviation.

The actual number of planes which showed up at Orly before the dead line at noon on Aug. 3 was 55, representing eight different countries. The largest representation was that of Germany with 8 B.F.W.'s, 6 Klemms, 3 Junkers, 2 Raab-Katzensteins, 2 Albatroses, 1 Arado, 1 D18 (Darnstadt Akademische Fliegergruppe), and 1 Focke-Wulf, making a total of 24 planes. Italy had twelve machines: 4 Fiats, 4 Officine Ferroviarie Meridionale (Romeos), 3 Bredas, 1 Cantiere Navale Triestino. France had nine: 5 Potez, 3 Caudrons, 1 Guerchais. Also entered under the auspices of the Aero Club of France were 2 St. Huberts (Belgian), 2 Moths (British), 1 Icarus-Michlovitch (Jugo-Slav). Czechoslovakia had 2 Avias and 1 Aero, while Switzerland had 2 Klemms. The United States was represented by a few unofficial observers.

Entries were made through the Aero Clubs of the various countries and practically all the planes partic-

PLANE TOUR

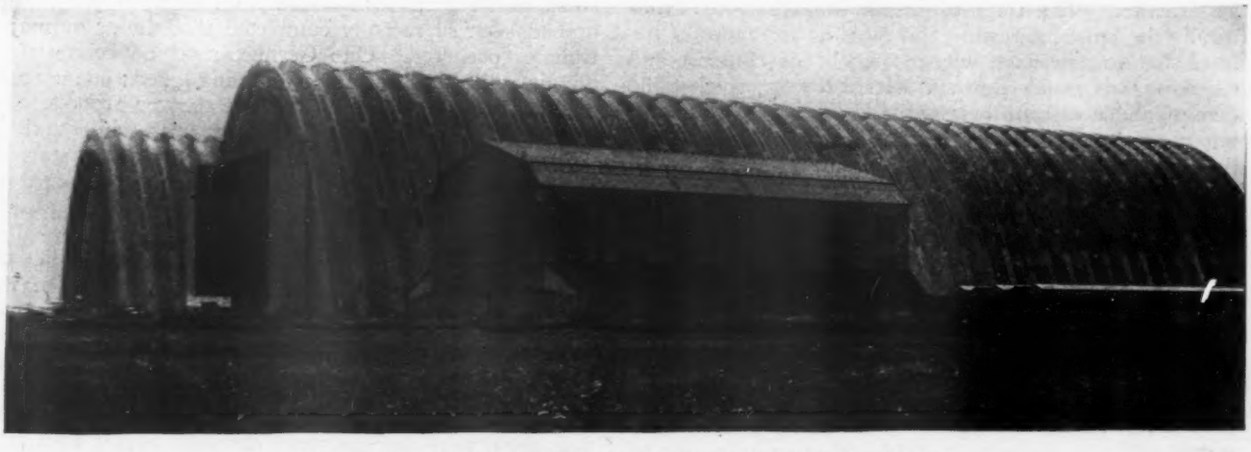
The tour of Europe, of which the opening stages are described by Mr. Osborn, continued successfully to its close with thirty-two machines among the forty-three starters reaching the finish. It represents a phase in an energetic effort to promote the idea of private use of light airplanes for touring in Europe. Both in the plan of the tour and in the design practices shown in the machines entered there was much to interest the American industry.

ipating were sponsored by their manufacturers. All the entrants were required to carry two people. There were two classes, one for planes weighing up to 616 lb. empty, and one for those weighing up to 880 lb. empty. The winning of the contest was based on a formula in which speed in actual flight was the most important. The maximum number of points which could be gained by any contestant was 165, divided as follows: practical qualities of the plane, 40 points; gasoline consumption, 20 points; regularity, 35 points; speed, 70 points. No points were given for quickness of take-off or landing, and as a result several of the German machines were really special racing planes.

The points granted for the practical qualities were divided as follows: strength of construction, instruments and landing gear, 8 points; self starter, 3 points; dual control, 2 points; parachutes, 2 points; fire extinguishers, 6 points; folding wings, 5 points; for reliability (various parts of the engines and plane being sealed), 10 points; not changing propeller, 3 points; not changing a wheel, 1 point; total, 40 points. These points to be assigned by a committee of judges representing the various aero clubs.

Partly to give the tour more of the aspect of a race, and partly because it would have been impossible to handle all of the planes on some of the smaller airdromes at one time, contestants were allowed to cover more than one stage a day. There were 25 compulsory stops, but others were allowed without penalization except that speed was figured on elapsed time between listed stops only. The controls were open from seven in the morning until eight at night, and to gain the full 35 points for regularity contestants had to cover at least one lap each day. The minimum time for completing the course was eight days, and the maximum was fourteen. The average length of the laps was about 160 miles, the longest being 260 miles and the shortest 76 miles. Due to passport and customs difficulties, it was expected that there would be considerable delays when going from one country to another. There were also persistant rumors that certain countries would not allow fliers from certain other countries to land at all. In any event, there were four military zones on the direct course, over which the fliers were not supposed to pass. [Charges that some of the pilots ignored this stipulation led to some dispute over the awarding of the prizes after the tour.—Ed.]

The handling of the planes at Orly was excellent. The machines were housed in the airship hangars, which are reinforced concrete buildings over 900 ft. long, 150 ft. high and 300 ft. wide. The 50 contesting planes only occupied about one-third of one of the hangars. The planes of the various nations were grouped together, and each type was given a letter in addition to its number, so that they were easy to identify. The procedure of weighing, judging the practical qualities, and the consumption tests were carried on with a smoothness which



Concrete hangars at Orly where the planes were housed before the race

was a great credit to the organization of the French Aero Club.

There were twenty different types of planes which arrived in time for the opening of the meet. All but one were two-seaters, a type which is only beginning to receive serious attention in this country, and with a few notable exceptions such as the Moths and the Klemms they were more or less experimental machines. By this is meant that many of them had only been recently completed and that they had not been proved over a series of years in practical commercial operation. The Europeans are accustomed to very small low-powered cars and it may be that there will be a market abroad for the smaller of the two classes of planes listed in the tour, but it is hardly likely that they would fill a popular demand in America. A plane weighing only 600 lb. is a pretty small affair, and many of these planes were not large enough to seat comfortably a full-sized passenger. The power plants in these smaller planes ranged from 40 to 80 hp., and with the latter a 600-lb. plane should have plenty of reserve.

There were very decided national characteristics in the planes. Almost all of the German planes were low-wing monoplanes, the Italians were all high-wing monoplanes, the only two British entries were biplanes, while the French had examples of both. The German Klemms are well known in this country, as they are built by the

Raab-Katzenstein 25, with 75 hp. Cirrus engine

Aeromarine Plane and Motor Company. The B.F.W. is very similar, except that the wing is slightly more tapered and smaller. The three all-metal Junkers were structurally the most interesting and pleasing machines at the meet, but the fuselage was too small for comfort and the wing was rather thin and of small area, so that the take-off did not seem to be satisfactory. Also the landing gear of one of them collapsed while taxiing across the field. The other German planes were built by small firms or groups and were distinctly experimental in their design. They showed strongly the influence that gliding has had on German design, and were most pleasing to look at. One of the most interesting was that of the Akademische Fliegergruppe, D-18. It was a true cantilever biplane with so much stagger that the leading edge of the lower wing was to the rear of the trailing edge of the upper wing. This arrangement gives excellent visibility, and apparently the plane had a good take-off and low fuel consumption combined with considerable speed.

The French Potez is a two-seater reminding one of an enlarged Monocoupe, rather crudely built but comfortable to sit in and selling for $2,000. The Caudron, after having built a high-wing monoplane for several years, is now building a low-wing machine which, though not especially pleasing to look at, gives the appearance of being substantial. The Guerchais was very reminiscent of a Cessna, but built entirely of plywood. All the French machines were new types and looked rather crude and experimental.

The Italian machines were those which had been developed in Italian light plane competition. They were all of the high-wing externally-braced type, and looked like practical machines. The Fiat, for which an order for 300 has been placed by the Italian government, seemed rugged and well built, though the design gave the impression of being a little old-fashioned. The wing bracing extended over the pilot's head, allowing the fuselage to be cut away for ease of entrance to the seats.

WHEN ALL IS SAID AND DONE, however, the two English Moths were as workmanlike and practical as any of the machines in the tour, and certainly they have the advantage of having proved their practical value and having already gone through their teething troubles. It will be interesting to see the final results of the meet, and it will be surprising if these machines do not show up well. [Mr. Osborn's manuscript was of course prepared and forwarded just as the tour was starting. One of the Moths, piloted by Captain Broad, actually made the fastest time around the circuit. Results of the tour will be found in the foreign news section.—ED.]

In construction, most of the machines were built of plywood with wooden wings. None of them was fitted with slots or with brakes. Rubber cords or disks were more common than oleos in the landing gears. All the engines were air-cooled, and the majority of them were radials. Most of the planes were fitted with speaking tubes, but only a few of them with parachutes.

The financing of the tour was done in large part through the entrance fees paid by the various entering aero clubs. The first prize was about $4,000, the second $2,000, the third about $1,000 and there were seventeen prizes of about $300. Besides this, various cities along the route are giving special prizes and various of the manufacturers of planes and engines are giving special prizes if their products win or place.

Out of the 55 planes which arrived in time to enter, only 43 actually started. Some of the entrants were overweight, some failed in the gasoline consumption trials, and several were of such an experimental nature or had been so recently completed that minor or major troubles occurred. One German machine collapsed in the air while stunting, the pilot being killed; one crashed on landing when the pilot did not recover from a side-slip; and one collapsed its landing gear while taxiing.

For the consumption tests and for the actual start of the race the planes were lined up and then started in batches of three or four at a time. Many of the planes, especially in the lower weight class, seemed underpowered. On the whole, the biplanes seemed to get off and climb better than the monoplanes. Several of the machines took long runs and did not turn until they had flown for half or three-quarters of a mile. It was obvious that many of the designers had built planes which, though efficient, were not suitable for the amateur flier who needs ample reserve power. It is most unfortunate that there were no American entrants, as the tour is a real test both of the planes and the pilots.

THE N. A. A. CONVENES

The National Aeronautical Association, in the Annual Settlement of its Affairs, Re-elects Senator Bingham

THE National Aeronautical Association held its eighth annual convention in Cleveland on Thursday, Friday and Saturday of the week of the races. The convention, of which the final session was actually attended by about one hundred duly certified delegates, was unmarked by factional strifes. Approval of the work done by the present administration and a wish for the assurance of the continuity of its policies, which the chairman of the nominating committee expressed in submitting his report, appeared to be generally shared by the delegates.

The nominating committee, presided over by Dr. George W. Lewis of Washington, brought in the name of Senator Hiram Bingham of Connecticut as the only nominee for the presidency. There being no other nomination from the floor, Senator Bingham was unanimously elected. The present vice-president, Roscoe Vaughan of Wichita, was also chosen for another term.

Col. B. F. Castle, chosen as treasurer of the association at its first convention and veteran of seven years in that office, had made known to the nominating committee that his new industrial responsibilities would make it impracticable for him longer to devote attention to the work. To succeed him the committee proposed John F. Victory of Washington, assistant secretary of the National Advisory Committee for Aeronautics and presiding officer over the present convention and various sessions of its predecessors. For secretary, G. E. McDaneld of California was nominated. In every case the committee's nominees were unanimously approved.

As governors at large, three of the present board were nominated together with two new members. To the names of Orville Wright, Godfrey L. Cabot and Porter H. Adams, there were added those of William P. MacCracken Jr. and Benjamin F. Castle. Mr. Rankin nominated from the floor Mr. Thurkelsen to provide a representative in the group for the Pacific Coast. Secretary MacCracken offered to withdraw his name in order that the Pacific Coast might be represented, but Mr. Rankin after consideration decided to withdraw his nominee rather than press his selection in place of any of the five men already named. In doing so he expressed an earnest hope that the nominating committee would provide for representation of the Coast territory in the future.

The work of the national nominating committee concluded, governors for the various states were nominated from the floor by the chairmen of state delegations. In most instances the present state governors were continued.

In a brief speech of acceptance and appreciation of the action of the convention, Senator Bingham expressed his determination to give to the association all of the time that his public duties permitted, and regretted that it had been difficult for him to find the opportunity of visiting the chapters as he would have desired to do during the past year.

Above: Senator Hiram Bingham, re-elected president of the N.A.A. Left: Frederick R. Neely, general manager

Senator Bingham had spoken at considerably greater length on the opening day of the convention, reporting on the Association's work during the past year. A keynote address was delivered by Col. Paul Henderson, who dealt especially with the necessity of keeping the industry on a firm foundation and steering a safe course between dangerous overexpansion and undue conservatism or pessimism.

The resolutions committee, as on several past occasions, was headed by Godfrey L. Cabot of Boston, past president of the Association, and brought in a total of twenty general resolutions in its two reports.

IN SPECIFIC APPLICATION to the work of N.A.A. they recommended, among other things, that a new and comprehensive plan should be evolved for awarding the national races, to provide for adequate compensation to the N.A.A. for its services and for its proper identification with the races and their conduct, a special committee of three to be appointed to study the matter. Another resolution requested that the contest committee draw up a clear and complete statement of the conditions governing the sanction of competitions in general, and another directed that the committee give study to the subject of performance claims for aircraft by interested parties and to the possible desirability of providing means of checking or authenticating them.

In the more general field the resolutions called for the construction by the Federal government of a model airport at Washington, for a more liberal support by

Congress of the five-year programs of the Army and Navy, which were declared to be menaced with failure by inadequate appropriations, and commended the three assistant secretaries of War, Navy and Commerce both for their work in their own departments and especially for their cooperation. The resolution pledged the Association's support to their efforts.

Another resolution conveyed the felicitations of the Association to Dr. Eckener, and urged upon the Navy Department the importance of supporting an American airship program. Another conveyed the good wishes of the convention to Mr. Porter Adams, the president in 1927 and 1928, and expressed regret over his unfortunate inability to attend. Mr. Adams had been present at every previous convention since the inaugural one at Detroit seven years ago. The Association took formal action approving the participation of the Federal Government in the International meeting called in Paris by the International Commission for air navigation three months ago, and urged that the State Department should use all proper methods to promote such modifications in the International Convention as would make it acceptable for ratification by the United States. Another resolution bore upon the same topic, with special reference to the importance of American participation in the making of international rules for the division of air traffic into strata, or the selection of international air routes. Most of the resolutions were approved by the convention without material change. One which occasioned much discussion, and which was finally laid upon the table with a direction to the board of governors to study the subject and draft a substitute, was very long. It expressed gratification at the improvement in aircraft performance and especially in their commercial use, approved the actions by federal and municipal governments that had made the advances possible, and specifically recommended the extension of the present airway system and the provision of at least one good airport in each city.

SENATOR BINGHAM felt that the resolution as drafted was ambiguous and might be taken as indicating that the association was asking that the federal government build airports for all cities. Various amendments were suggested to make it clear that it was the municipalities that were being urged to act in that respect. The president of the Association said further, however, that he believed that the N.A.A. should concentrate all its efforts in Washington on the five-year programs. He briefly recounted the bitter struggle to get through each year the appropriations that the programs called for, and the reluctance that the Bureau of the Budget and the House of Representatives had displayed in granting the full amount necessary, especially for the army program. He further warned the convention that Congress was becoming nervous about the rising costs for airway construction and maintenance, and suggested that the state should be impelled to build their own airways and especially to spot in emergency landing fields scattered over their area so that a pilot in trouble could always be sure of having a landing field within a few miles. He took as an example the aid granted by the federal government in constructing highways, of which the state carries the major share of the cost. After further discussion the whole matter was tabled, with instructions that resolutions to be prepared by the board of governors should comply with the suggestions made by Senator Bingham.

A few other resolutions were rejected after consideration, because they appeared to the convention of insufficient importance to justify dispersion of the Association's efforts or because of questionable legal feasibility of taking the action that had been suggested. One such appealed for the passage of laws or regulations prohibiting the maintenance of any sign likely to mislead pilots as to their whereabouts. This is of course already covered in part by sections in the Air Commerce act prohibiting the maintenance of a false or misguiding air navigation utility. Another proposal that was voted down would have called for the remission of any gas tax on fuel used in airplanes.

The resolutions committee further brought in, as the last scheduled item of the convention's business, resolutions of appreciation to Colonel Castle for his long and efficient service as treasurer, to the City of Cleveland for its hospitality, and to the Cleveland chapter, and especially to Floyd J. Logan, for their share in conducting the air races.

OTHER COMMITTEES REPORTED, and addresses were made from time to time. Clem W. Gerson of Washington presented the report of the committee on N.A.A. hotels. The committee recommended the certification and the granting of the right to display the Association's insignia, to one hotel in each city which undertakes to set aside a room for the use of the N.A.A. membership, providing trip maps, weather reports, etc., to grant space for chapter and other meetings, and to make special arrangements for furnishing accommodations to N.A.A. members at all times. About ten hotels, including the Cleveland in Cleveland, the Ambassador in Los Angeles, the Carlton in Washington, the Fontenelle in Omaha, and the William Penn in Pittsburgh have already been approved by the committee. A number of hostelries in other cities, including Boston, Baltimore, Atlanta, and Seattle have accepted the requirements but have not yet been formally nominated.

Some discontent was shown over the present practice, observed every year except in 1927, of holding the annual convention in conjunction with the National Air Races. The membership committee informally suggested that the convention be held in Washington at the time of the National Advisory Committee's spring meeting of the industry at Langley Field. It was also proposed that inasmuch as the races took too much of everyone's time, and especially of that of the local members, to permit of their giving attention to the convention, the convention might be held in the same city with the national races but about two weeks earlier.

The N.A.A. private flying club plan was explained to the convention both by J. Brooks Parker, head of the brokerage firm handling the insurance, and by the writer, chairman of the private flying club committee. The financial aspects of the scheme were explained in particular detail, and the questions that had been most commonly asked and the objections that had been frequently raised in correspondence were answered from the platform. It was reported that only two charters had so far been actually awarded but that a substantial amount of interest was being shown and that the formation of a number of other clubs was anticipated for the near future. Various firms in the aircraft industry have shown marked interest and the desire to cooperate actively.

Shortly after noon on Saturday, the convention, with no more business to come before it, adjourned sine die.

IMPRESSIONS OF Olympia

By JOHN R. CAUTLEY

IT WAS UNFORTUNATE for one American visitor that pressure of his own business prevented that detailed study of the London Show which would have more than repaid anyone interested in the technique of aviation. These, therefore, are general impressions which are subject to the errors due to lack of time for thorough study.

Olympia might be compared to two Chicago Coliseums alongside each other, and another extension is in process of erection. In general this allows the exhibition of machines in a most adequate way, and the balconies form vantage points for bird's-eye views which are a great help in observing of the machines. Another point is the facilities for obtaining food, which are totally lacking at all American shows. But the outstanding thing about the show was its predominantly military character. In a general way the machines exhibited might be divided: (1) Military, (2) Political, (3) Sport, (4) Commercial.

This is the third article that we have presented upon the Olympia Show. Its predecessors treated the Show in detail. Mr. Cautley's survey is frankly impressionistic. Mr. Cautley, who is well known as an engineer of the Bendix Brake Company, has undertaken to show how the Olympia display would affect an engineer dropped into its midst fresh from American experiences.

1. Military

THE FIRST CLASS needs no explanation, and the machines themselves have by this time been completely described, so that they may be passed over with a few general comments. The pursuit machines would appear to be ahead of those built in the U. S. A., and are very definitely designed for a high speed at 20,000 feet, which speed one is given to understand is in the neighborhood of 200 m.p.h. This will take some beating!

Most of the planes are conventional, but the Vickers low-wing monoplane is a most interesting deviation. No details are available, but the all-metal structure, rather high split landing gear and general cleanness of outline make its performance well worth watching.

The Fairey ships are noticeable for their clean appearance.

In general the larger military land machines do not stand out in a mental picture as a whole, but have many interesting details.

The big naval flying boats *do* stand out. First, as obviously designed by people thoroughly imbued with naval ideas; second, as being extremely seaworthy and built to stand knocking about on the water; third, as having a tremendous amount of bracing, rigging, etc., which certainly cannot add to speed, but may be necessary to assure the second item. It will be most interesting to see whether these large boats can be cleaned up in appearance during the next few years, and if such cleaning does not aid performance materially.

2. Political

THIS IS PERHAPS a peculiar classification, but a definite one. In this class fall such ships as the Fairey long-distance machine. A splendid effort, but useful only as a means of Empire communication should radio fail. Also the big air liners such as Handley Page and Armstrong Siddeley build. They are passenger and mail liners, it is true, but their main purpose is again Empire communication in time of peace. Probably out of them will grow the main support for the British aircraft industry, and it is a pity that more firms have not tackled this problem.

Finally, attached to this class, but having leanings toward the true commercial (although the extreme stern of the hull would accommodate a machine gunner aft of the rudder) is the Blackburn "Nile" Flying

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Boat. The hull alone is shown, but it is beautifully finished and looks both clean and businesslike. If the rest of the structure is as clean cut the completed boat should give a very fine account of itself.

3. Sport

WE HAVE HEARD all about them. Light planes! Fine. Good for training, probably good for the relatively short distances in Great Britain, but not a business proposition or a solid foundation for a great industry. The automobile had to become basically a business vehicle and a necessary means of transport before it grew great.

4. Commercial

A FEW EXAMPLES of what would be called commercial planes are shown. In other words, four-seaters or larger, 200 hp. or more, closed cabins, single or multiple

Short two-passenger, with amphibion landing gear

engines, and by no stretch of the imagination military or naval machines.

A. V. Roe has frankly taken a license from Fokker at Amsterdam. They have a very good-looking three-engined full-sized Fokker, and what one might call a scale model seating four and mounting three Siddeley Genet engines. Perhaps these four-seater three-engine planes are the coming thing, and if so this, as well as the Westland three-engined plane, should do very well. But neither has a cruising speed of over 100 m.p.h., which would appear low for the man who is going somewhere.

The above as well as the other examples, show definitely that developments in the U. S. A. have not gone unobserved. Whether they have been completely observed, and possibly improved upon, or incompletely and incorrectly used, would take detailed study and a lot of flying to find out.

Before leaving the planes at large, the entirely commercial Saunders Flying Boat recommends itself to the eye at least by its clean outline. The engines above the monoplane wing are unconventional from an English or American viewpoint, but this position has the support of both German and Italian constructors. Here again the top speed of 105 m.p.h. is quite consistent with present day practice, but might be increased to advantage.

Random Shots

LEAVING THE BROADER ASPECTS of the show one is confronted by a large number of interesting things which are possibly best covered by a series of somewhat unrelated notations.

Engines, of course, come first.

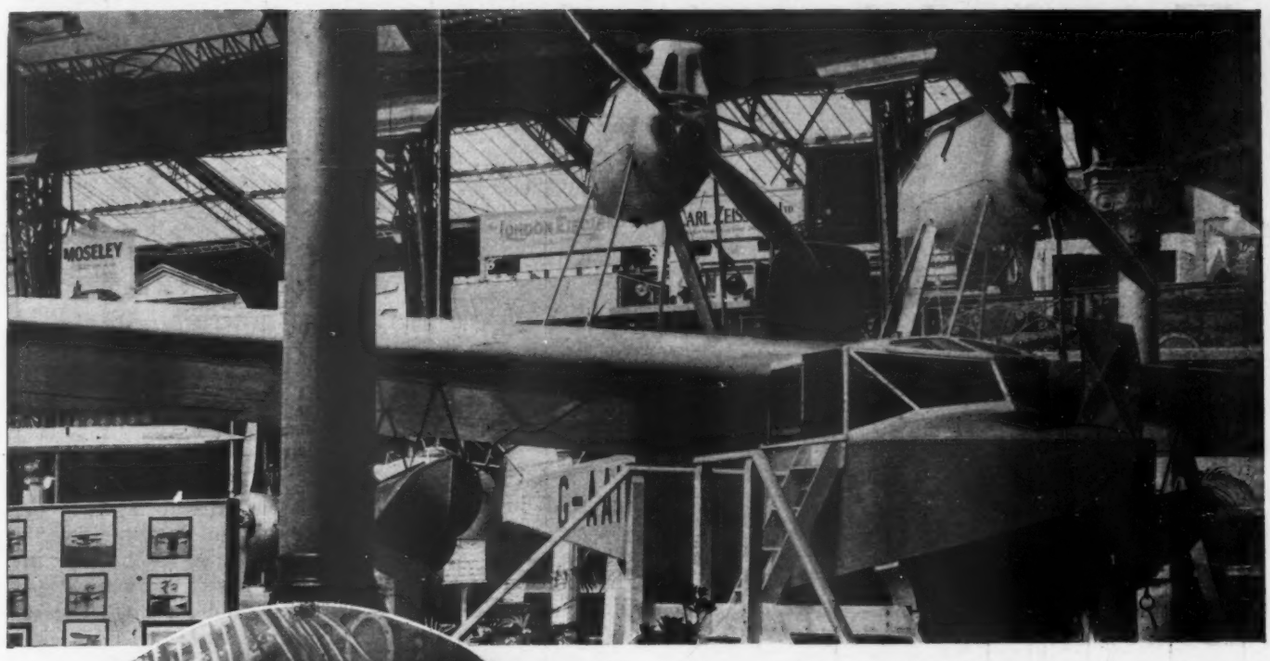
Unfortunately for these notes, some of the foremost American technicians were at the show and this observer is really afraid to make comments which would be taken to bits by those better informed. [Professor C. F. Taylor analyzed the engine exhibits at length in *Aviation* for Aug. 31.—ED.] It would appear in general that east of the Atlantic the radial is not having things all its own way, but this type, with reduction gears, low and high duty superchargers, and various types of cowling, is giving the fluid-cooled engines a real run for their money. There were no examples of Ethylene Glycol cooling noted, but such machines may be on the secret list. The only radically different engines were two wobble-plate designs. Such have been tried before, and these will have to be proved thoroughly before they attract great interest.

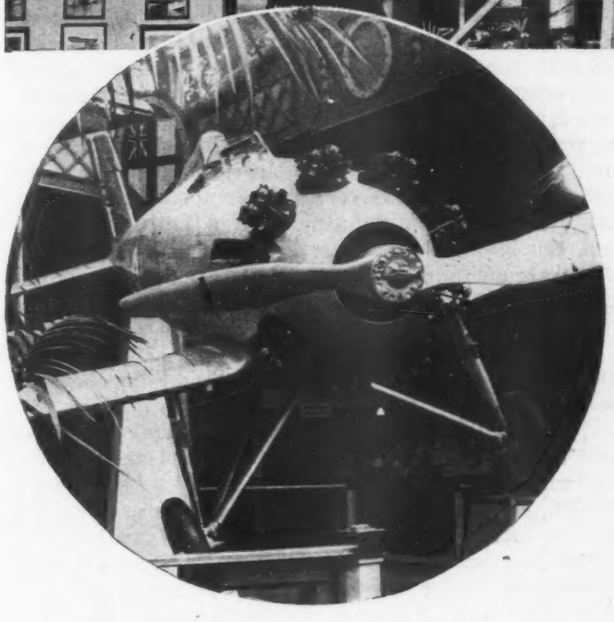
In detail plane design all interest is directed toward metal construction. However, the British designer is in general still consistently opposed to welded fuselages.

There is a wide divergence of opinion as to the relative merits of steel and dural. Some use all dural, some both metals and some all steel. It would appear that steel is gaining ground, and it is believed that an airplane designer could have spent the whole period of the show most profitably studying the various methods of construction and especially the variations in design and fabrication which grow out of the use of very thin steel. The fixtures and machines for forming must have taken much ingenuity and thought in their development.

To an American, the landing gear design of the smaller military machines was surprising. A number of different makes retain the straight axle which has competely died out in the U. S. A. Whether America has

Short "Singapore" flying boat, with duralumin hull and spars





Above: Saunders "Cutty Sark" four-passenger monoplane, fitted with two 105 hp. Hermer engines. Left: Vickers all metal low-wing army pursuit plane. The duraluminum sheets are rived to each other by the Wibault process

over-emphasized the split landing gear for specific purposes is a point for argument.

Certainly, the straight axle can be made light, and the wheel motions on landing are usually much easier on the wheels and tires. Oleo gears are practically universal, and it is to be regretted that more time was not available for their study.

Due to the military character of the show, wide-tread landing gears in single-engined machines were not so prevalent as in the U. S. A. This, of course, was in part due to the use of straight axles.

Brakes are just beginning to make themselves felt (in both senses of the word). There were approximately twenty machines so fitted, and this observer might be accused of attempting to advertise if he stated the numbers of the various makes.

Amphibions have not apparently taken hold of the designers' imaginations to any great extent, and no outstanding examples were seen.

The exhibits of the military establishments and the technical societies were most elaborate and interesting, both from an historical and an engineering viewpoint. Considerable space would be required for proper comments on the Olympia Show, and they are left for those better qualified.

The show was thoroughly international in its scope, and one was sorry that the American representation was so small. Much of the Continental European industry was represented by engines, and the plane side was for the most part illustrated by models and photographs.

The writer's imagination was captivated by the Dernier Stand, where a fine model of their Giant Boat was shown, with numerous photographs of the boat itself, both at rest and in flight. It is a most ambitious conception and apparently very well carried out.

One point might again be emphasized, and that is that American designers gain much by coming to such a show. Not all that they see is directly applicable, but there is much food for thought in details which could hardly be transmitted by any articles or reports.

Conclusion

THIS COMMENT on the show has been written in an attempt to indicate the very different problems confronting British designers in particular from those faced by designers in America. There is certainly not the domestic market for commercial machines that there is in the U. S. Weather conditions are unfavorable, distances are short, the population is less, and the country is not so prosperous. There should be a great market growing out of the political type of machine, and a good one for what has been termed the purely commercial type in the communications to and in the outlying portions of the Commonwealths of the Empire.

It is hoped that members of British aircraft industry may be able to take advantage of these potential markets and reap the reward which their hard work thoroughly deserves.

Ford Motor Company AND AERONAUTIC

By JOHN T. NEVILL

Ford Air Mail Lines Are Inaugurated; the Company Demonstrates Radio for Planes; Henry Ford Flies with Lindbergh

IF THE YEAR 1927, featured by the Lindbergh flight to Paris, will be remembered as that point in aviation history when the business of flying gained a foothold in America, surely the year 1926 can be said to have given the industry a fingerhold on the ladder of this nation's commerce.

That must be conceded, if, as has been said, contract air mail is the backbone of American air transport. For, beginning with the Ford-operated Detroit-Chicago and Detroit-Cleveland mail routes, which began service on Feb. 15, 1926, regular schedule private mail lines began to go into operation in various parts of the country. [The writer realizes that operation of the Ford mail lines was preceded by that of several other contract mail routes, such as the Seattle-Victoria route (Oct. 15, 1920), the New Orleans-Pilottown route (April 9, 1923), and the Fairbanks-McGrath, Alaskan route (Feb. 1, to June 30, 1924) but they were not regularly operated domestic routes. The former two routes were placed in operation principally to handle late mail to and from steamers and their operation was dependent upon the schedules of such vessels]. By June 30, of that year, there was a total of twelve air mail lines in operation, eleven of them being operated under private contract. The remaining one, of course, was the government-operated transcontinental route between the coasts. These routes, including the transcontinental route, covered altogether 6,624 mi., and were as shown in Fig. 1.

During the succeeding six months of that year four additional contract mail routes were placed in operation, notably the New York-Boston and Los Angeles-Seattle routes, operated by Colonial Air Transport and Pacific Air Transport, respectively.

By the end of 1926, more than $5,000,000 had been invested in the nation's contract airway system by private contractors. The system had a total of 55 station stops; and more than 2,000 mi. (all included in that portion of the transcontinental route between New York and Salt Lake) had been lighted for night flying.

These mail routes, six of which carried passengers, and other routes devoted solely to passenger traffic which had begun to spring up, began to create the market toward which Henry Ford had looked when he entered the aeronautics field. The company has since found a large marketing field in the American and Canadian governments, in private corporations not regarded as a part of the aviation industry, and in individuals, but there can be little doubt that its past and present sales to aircraft operating companies have been and are continuing to be demonstrations of worth upon which the other sales are based.

In line with, and resulting from, this increased usefulness, the year 1926 witnessed a similar increase in the production of both aircraft and engines. When the Kelly air mail act was passed in February, 1925, there were 24 aircraft and engine manufacturers having a total annual output valued at $12,524,719. By the end of 1926, the number of companies had increased to 59, with a total output for the year 1926 valued at $24,161,752, an increase of more than 60 per cent over the previous twelve months.

THUS IT WAS that the Ford Motor Company, having developed its plane to a point where it was deemed advisable to go after the existing market, was ready to do so just as that market began to open. At that time, however, the company was in no position to turn its product out in considerable quantity. Prior to October, 1926, when the new plant was completed and ready for occupancy, production of the tri-engined craft necessarily progressed slowly. Between January, 1926, and Jan. 29, 1927, in fact, only four of the 4-AT series had been produced, making an average of one airplane every three months.

With the transfer of operations to the new building, production has increased steadily from the four-a-year schedule effective then, to the four-a-week schedule in operation now. And, as this is written, the company announces building plans for enlarging their plant by 155 per cent and making possible the production of one plane a day. But more will be said about that later.

In a previous installment we mentioned the Ford Motor Company's experiments in radio communication work.

AMERICAN

DEVELOPMENT

Henry Ford leaving the cabin of the famous Ryan monoplane, "Spirit of St. Louis," in which he made his first flight Aug. 10, 1927

Early in 1927 these experiments had reached a stage where public demonstrations could be carried out. In this work, it should be understood, the Ford company did not stand alone. Since July, 1926, the Bureau of Standards, of the United States Department of Commerce, had been working actively along this same line. Other participating organizations included the General Electric Company and the United States Army Air Service.

The Bureau of Standards had established an experimental field at College Park, Md., in October, 1926, and in December had carried out some highly fruitful experiments, using a DH plane transferred from the Post Office Department. This work embraced both directional control and radio telephone communication.

However, on Feb. 10, 1927, the Ford Motor Company accomplished the first long distance airplane flight on which the plane was guided solely by radio. On that occasion a tri-engined machine, specially equipped for the experiment, was flown from Dearborn to McCook Field at Dayton, Ohio, and back, getting its course throughout the journey from radio "beams" transmitted from the Ford radio station in Dearborn. Another and more interesting experiment along this line was carried out the following May.

On Feb. 15, 1927, the Ford mail lines had completed one full year of service, and during the week Postmaster Charles C. Kellogg, of Detroit, issued a report covering the operations for the year. The report showed that 96.6 per cent of the scheduled flights over both the Chicago and Cleveland routes had been completed. Of the remaining 3.4 per cent 2.2 per cent was charged to weather conditions, or lack of mail, and 1.2 per cent to flights begun but not completed due to weather conditions encountered enroute. Between Feb. 15, 1926 and Feb. 1, 1927, the Ford mail planes had flown a total of approximately 84,000 miles and carried 7,749 lb. of mail.

Route	Operator	Started	Mileag
New York-San Francisco	P. O. Department	July 1, 1924	2,612
Detroit-Chicago	Ford Motor Company (*Now Thompson Aeronautical Corp.*)	Feb. 15, 1926	252
Detroit-Cleveland	Ford Motor Company (*Now Thompson Aeronautical Corp.*)	Feb. 15, 1926	155
Miami-Jacksonville	Florida Airways (*Now Pitcairn Aviation, Inc.*)	April 1, 1926	393
Salt Lake-Pasco	Walter T. Varney	April 6, 1926	535
Chicago-St. Louis, Wash.	Robertson Aircraft Corp.	April 15, 1926	268
Los Angeles-Salt Lake	Western Air Express	April 17, 1926	663
Chicago-Dallas	National Air Transport, Inc.	May 12, 1926	995
Pueblo-Cheyenne	Colorado Airways (*Now Western Air Express*)	May 31, 1926	200
Chicago-Minneapolis	Charles Dickinson (*Now Northwest Airways*)	June 7, 1926	399
Seattle-Victoria	Edward Hubbard (*Now Boeing Air Transport*)	Oct. 15, 1920	77
New Orleans-Pilottown	Arthur E. Cambas	April 9 1923	75
			6,594

Tabular History of Early Air Mail Lines

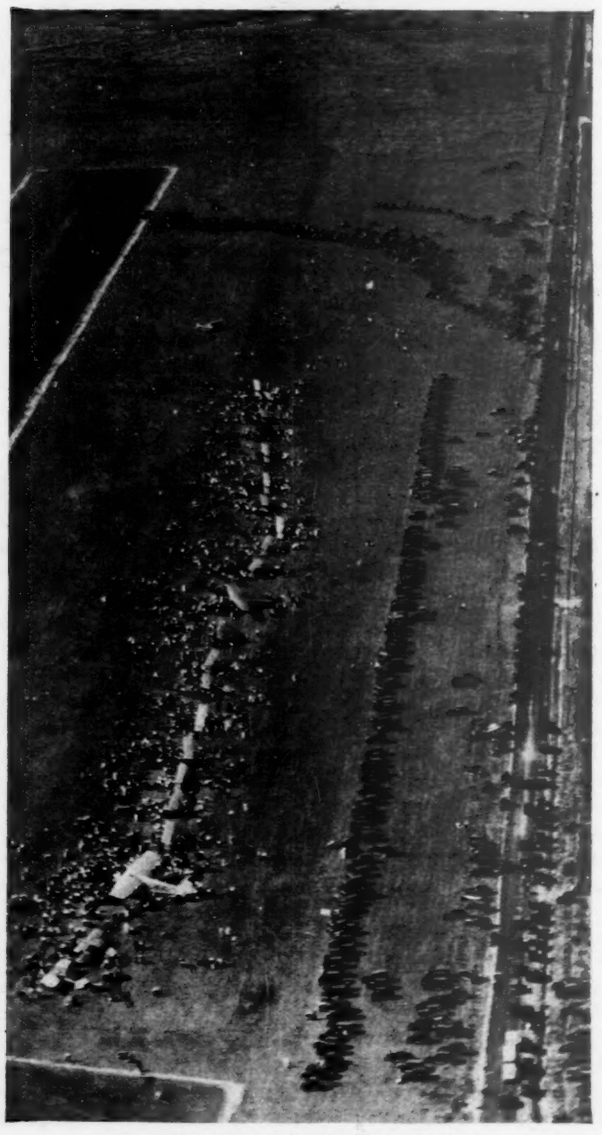
IN HIS REPORT Postmaster Kellogg revealed something of Mr. Ford's willingness to cooperate with the government agencies in the furtherance of aviation. "Too much cannot be said in behalf of the attitude of the Ford Motor Company," the report read. "Quite a long time before this contract service was established, Mr. Ford offered to carry the mails without compensation over these routes so that the department might acquire sufficient data whereon to base its schedules and its rates, and to make the necessary preliminary arrangements. We should not lose sight of the fact that were it not that the Ford Motor Company is furnishing transportation for its own products, the air mail over these routes would have to be carried at a loss."

The Detroit-Buffalo route of the Ford airlines was inaugurated March 28, 1927, increasing the daily mileage of flying to 1,436 miles. The Buffalo line, however, did not carry mail, since the Detroit-Buffalo run had not been officially designated as an air mail route. The following months saw completion of the company's second year of airline operation, a two-year period during which the company's planes had flown a total of 570,670 mi., transported 3,062,044 lb. of Ford freight, and 9,885 lb. of United States mail. The company at that time still had one of its early model single-engined planes in daily service. It had been flown nearly 132,000 miles.

The month of May, 1927, was featured by another demonstration of the company's experiments in the field of radio. In aviation the world over, that month is memorable for one of the greatest flights of all time—a flight which did more to popularize aviation than any

venture before or since. When Charles A. Lindbergh landed his Ryan monoplane on Le Bourget field on the 21st day of May, following his never-to-be-forgotten journey across the sea, aviation as a business and as a utility immediately assumed a more substantial form in the eyes of the American investor. But that is a different story, and one far too well known to repeat here.

From May 2-6 the All-American Aircraft Display was held in Washington. During the exposition, the Bureau of Standards demonstrated its directive radio beacon and radio telephone in a practical way, to and from airplanes at the Display. Following the Washington event, a tri-engined Ford monoplane, equipped with a radio compass, took off from Bolling Field on the return



The Ford Tour of 1926 reaches Chicago

flight to Detroit. There were eight men in the plane: William B. Mayo; William B. Stout; Harry Brooks, the pilot; Harry Russell, the mechanic; two Bureau of Standards engineers; and two newspapermen. Constant telephonic communication was maintained with those on the ground in Washington until the plane was approximately 100 miles away from the capital.

Bill Stout gives a most interesting account of this flight. "We were about 30 miles out from Washington," says Mr. Stout, "and I was talking with someone in the Washington laboratory of the Bureau of Standards. I decided to have a little chat with my old friend Bill MacCracken, so I furnished the Bureau of Standards with his office telephone number and they got him on the line. Through a connection in the Bureau's office I was able to talk with him, and we both got a great kick out of it."

AFTER the plane had departed from Washington it was decided to land at Buffalo, where a prospective plane purchaser was waiting. As it happened, Bill Stout had a formal dinner appointment in Detroit for 8 o'clock that night and the intended Buffalo delay worried him not a little. After some cogitation, and thanks to the plane's special equipment, he saw a way out. Utilizing the radio telephone, he asked a Bureau of Standards official in Washington to wire Mrs. Stout that he would be late into Detroit, and would she please meet him at the airport with the car.

"After that," Mr. Stout said, "I felt much easier. We landed at Buffalo, picked up a couple of passengers, flew up over Niagara Falls, returned to Buffalo, and then took off for Detroit. A short while before we were due to land I opened up my suit-case, and changed into my dinner clothes. My wife had received the wire and met me when our plane landed. I got to the dinner in good time."

Radio was used in connection with the company's planes on two notable occasions after that flight. The first was in June, when the Bureau of Standards equipped a Ford plane, from which the reception accorded Colonel Lindbergh when he returned to America aboard the cruiser "Memphis" was broadcast. The other was during the third annual Ford reliability tour that summer. The company's entry in the tour was equipped with a transmitter and receiver having a range of 500 miles, as well as a radio compass. With the exception of 335 miles between Dallas, Tex., and Wichita, Kan. the plane kept in constant touch with Dearborn during the entire tour.

Aside from the Lindbergh flight and its magic effects, the spring and summer of 1927 will be remembered for another great progressive step in American aviation. Following seven years of development in an incubator, so to speak, the government was ready to relinquish its last hold on the nation's air mail system. On July 1, the Boeing company, successful bidders for the 1,895-mi. stretch between Chicago and San Francisco, began operation of that portion of the transcontinental route. The Chicago New York section, 712 miles in length, was awarded to National Air Transport, Inc., and formally turned over to them for operation on Aug. 15.

Until this time, despite his tremendous investment in aviation, and despite his repeatedly expressed faith in the airplane as a common carrier, Henry Ford, himself, had never flown. But, on Aug. 10, 1927, Colonel Lindbergh went to Detroit and took Mr. Ford for a ride.

The flight was made in the "Spirit of St. Louis" and the distinguished passenger sat on an improvised seat, a wooden box, during his first journey in the air.

Following this, Mr. Ford made a second flight, this time in one of his own planes, with Colonel Lindbergh as his guest.

The eighth and last article of this series by Mr. Nevill will appear in an early issue of AVIATION.

A. S. M. E. Seaplane Meeting AT CLEVELAND

Rohrbach, Richardson, Sikorsky and Others Speak on Marine Flying

By EDWARD P. WARNER

Dr. Adolf Rohrbach

ONE OF THE CLOSING EVENTS of the Race Week was the technical program arranged by the American Society of Mechanical Engineers and held in the Austin hangar at the airport on the morning of August 31. Seven papers had been scheduled for the meeting, over which the Hon. David S. Ingalls, Assistant Secretary of the Navy for Aeronautics, presided, but owing to lack of time and the absence of some of the authors only four were actually delivered.

Senor Juan de la Cierva presented a paper on the autogiro similar to the one which he had delivered before the Society of Automotive Engineers earlier in the week, as described in the September 7 issue of AVIATION. Interest in the subject had in the meantime been intensified by Senor de la Cierva's several demonstrations of his own machine in flight at the airport, displays in the course of which he had put the champions of the airplane dead-stick landing contests to shame by dropping the autogiro vertically directly on top of the spot used as a target in the accuracy competition.

Of the more formal papers for which manuscripts had been prepared the longest was jointly written by T. P. Wright, chief engineer of the Curtiss Company, and G. A. Luburg, his assistant. It was a general recapitulation of the uses of seaplanes and the conditions governing their design and construction.

Like others who have made a special study of the subject, Mr. Wright and Mr. Luburg laid great stress upon the commercial advantages offered by the ubiquity of seaplane landing fields and by the usual convenience of a city's waterfront to its business center. Other points of advantage for the seaplane, less often stressed, were also pointed out. Among them were the availability of lighthouses and other aids to navigation, already existing all along our coast lines and important rivers for the benefit of water craft and equally serviceable for navigation by air. The primary importance of safety in air transport was taken by the authors as a fundamental tenet.

The body of the paper was largely designed to inform readers of limited experience in aeronautical engineering, and contained little that was new in its treatment of the subject. The subject of maneuverability on the water was given more attention than it sometimes receives, and the authors spoke kindly of the use of a water rudder to aid in securing it. In describing their ideas of hull design they suggested that the step should be placed from 1½ to 2 ft. aft of the center of gravity of the plane, and that the V of the bottom should be very hollow, or much flared, near the bow so that the plan form of the hull at the chine might be very full in the bow. Usual American practice in float and hull design conforms to this rule, but some of the most successful of German flying boats have had very fine lines forward.

A point in design often overlooked, but which received careful attention from Mr. Wright, is the form of the stern and its effect upon the longitudinal stability and take-off qualities of a hull. The paper stressed the necessity of caution with a short hull, and tail surfaces carried on booms lest the machine should capsize backwards when drifting in a head wind.

Mr. Wright and Mr. Luburg suggested that they saw possibilities in the use of hydrovanes, or separate planing surfaces below the hull of a seaplane. They recognized the practical difficulties, but urged further research upon the scheme.

For the design of a float-supporting structure they recommended that a load factor of 8 be assumed in landing. The actual distribution of pressure on a float bottom when taxiing at a high speed has been indicated by tests made by the N.A.C.A. for the Navy. As the paper pointed out, the maximum loads were found just forward of the step and reached 7 lb. per sq.in.

Summarizing construction practice, attention was called to the advantages of the composite type with wooden frames and a metal skin, especially in small production where it proves, so the authors declared, to have a very decided advantage in cost over the completely metal-framed structure.

DR. ADOLF ROHRBACH, famous builder of flying boats, treated the problem of design from a point of view somewhat different than that taken by Mr. Wright and his collaborator and went into more technical detail.

He laid particular stress on the necessity of using very high wing loadings if large airplanes are to be built without loss of structural efficiency and economy of operation. If that is to be taken as a fundamental necessity, he pointed out that the flying boat has an advantage over the landplane in very large sizes in that its wing loading can be increased to figures well beyond those practicable for landplanes which must operate from airports of limited dimensions. Dr. Rohrbach concluded that the size of a flying boat of maximum commercial economy was in the neighborhood of 20 to 25 tons gross weight, while the best commercial landplane would carry hardly half

T. P. Wright (left) and J. T. Trippe, who prepared papers on the use of seaplanes and amphibions

of that total load. The large flying boat has a further advantage in improved seaworthiness. The author made no suggestion, however, that the present limits on efficient size were permanent, and he felt there would be a continuation of the upward tendency.

Dr. Rohrbach gave the preference to the monoplane for flying boat service, both on aerodynamic and on structural grounds. He recommend tapered wings as being more advantageous in flying boats than in land planes, since they reduce the rolling motion on the water in side winds and make the boat easier to handle than it would be with wings of rectangular form. He touched upon a point which caused much discussion in America a few years ago, but has had little attention recently, in recommending the use of airfoil sections with very little center of pressure travel, and therefore very little movement of the center of pressure, even at some sacrifice of efficiency. Both the torsion in the wing and the loads on the tail structure can be reduced by the use of such a section, as can the size of the tail surfaces.

Dr. Rohrbach emphasized the importance of controllability in a stalled attitude as an adjunct to seaworthiness. Unless the machine were stable and under full control in taking off and landing under bad conditions it became dangerous. He recommended using a dihedral of from 4 to 8 deg. which is, of course, considerably larger than American practice ordinarily provides. The large dihedral being conducive to good spiral stability and the maintenance of approximately a correct bank without the use of the ailerons, the paper reported that it had been found possible to turn the Romar with angles of bank up to 70 deg. with the use of the rudder alone and the ailerons neutral.

In commenting on the conditions for the design of the flotation system, the author said that it was his practice to design the auxiliary side floats to give enough reserve of lateral stability for the machine to withstand a side wind of 30 m.p.h. without submerging the leeward float. The side floats in his design were given planing characteristics of their own to help to lift the machine up on to the surface just below the natural planing speed of the central hull. The structure with large auxiliary floats close to the hull had beeen found very seaworthy, and had stood severe gales and a great amount of abuse.

For bottom forms, the hulls built by Dr. Rohrbach and described in the paper have a pronounced curved V forward of the step, and a straight V aft. Two distinct steps are used. The design has been the result of extensive towing basin tests on models, several hundred models having been built and tried in a total of more than 2,000 runs. This general method of test is, of course, similar to that used in developing the hulls of U. S. Navy boats at the Washington Navy Yard. That tank having been built for other purposes and being quite limited in capacity, much improved provision for the tests of American hulls and floats will be available when the new basin of the National Advisory Committee for Aeronautics is completed at Langley Field. It is understood that the plans for it call for a size and operating speed beyond anything so far attempted elsewhere.

The form of hull developed in Dr. Rohrbach's tests and used by him of course differs notably from the practice of most other designers, especially in the small beam and high draft and freeboard. In the planing attitude, according to Dr. Rohrbach's paper, the Romar rides about four feet higher than when floating at rest, thus increasing the wing and propeller clearance in a rough sea, and take-offs and landings had been made in waves running twelve to fifteen feet high.

Taking up questions of material and structure, special emphasis was laid on the importance of corrosion protection and the necessity of using structural elements of open form, permitting thorough inspection at any time. For the inside of a structure, however, Dr. Rohrbach recommended water-tightness and the exclusion of the corroding agent as the best protections against detrioration. An example is found in the duralumin wings of these boats, which are made in the form of watertight boxes bolted together. It was pointed out, too, that the bouyancy thus secured was a safety factor in case of serious damage to the hull.

THE THIRD PAPER upon the general subject of design was prepared by Captain H. C. Richardson, vice-president in charge of engineering of the Great Lakes Aircraft Corporation. Captain Richardson's paper was not actually read at the meeting. It covered some of the same grounds gone over by Mr. Wright and his associate, but went into much more detail upon float form and its effect on present qualities. Captain Richardson especially warned float designers against the suction on the bottom if the keel has too much of a "rocker" form or is too much curved forward of the step in profile. This is especially objectionable on machines with a small reserve of power, as it may prevent getting past the "hump" speed and up onto the step. He mentioned the necessity of guarding against the use of float sections creating wave forms which would interfere with each other where they met aft of the float and might be troublesome to the tail surfaces of the seaplane.

The author was inclined to recommend a straight V

bottom in preference to a hollow V, notwithstanding the present tendency toward the latter. He found the hollow V likely to pound in rough water and likely to create bad wave formations. Captain Richardson recommended 20 degrees of V or a little more.

Referring to construction, he called attention to the increasing use of castings as fittings, stem-pieces, etc., in metal floats. He recommended machine screws in place of rivets for securing the bottom skin of a float, as more resistant to abrasion, and closed by pointing out that the practices of the naval architect and the ship constructor became increasingly applicable to float and hull construction as the size of the structures increased and as the problems received more detailed study and more refined solutions.

IGOR SIKORSKY, as might have been anticipated, spoke on more specialized lines, devoting himself particularly to the amphibion type which has claimed most of his professional attention for the last few years. Giving the credit to Grover Loening for having developed the first practical amphibion airplane, Mr. Sikorsky went on to discuss especially the practical advantages of an amphibion gear for commercial and private use. He added, however, certain specific figures pertaining to technical points upon which information has not been generally available. In his own latest amphibion, Mr. Sikorsky reported, the weight of the landing gear is 5½ per cent of the gross, and involves a subtraction of 14 per cent from the useful load. The parasite drag of the elements added for landing on the ground is about 9 per cent of the total parasite for the plane. The author frankly admitted those handicaps and also certain special problems of design peculiar to the type, such as the necessity of making the brake mechanism water-tight, or otherwise protecting it from damage and freezing as a result of taxiing with the wheels submerged. He pointed out also that the design of a tail skid which will not interfere with water performance was a peculiarly troublesome matter.

Turning to the economic side, Mr. Sikorsky, while concurring with Mr. Wright about the advantages of having landing fields for marine airplanes available close to the heart of most great cities, found another important benefit in the increased safety in forced landings. Within fifteen miles of the air line between New York and Washington, for example, he had determined that the total area of available emergency landing-fields, so marked on airway maps, was only 7.35 square miles, as against 550 square miles of available inland water.

Another special advantage foreseen for the amphibion was its use in connection with seadromes or artificial islands for transatlantic air traffic. Another was the case of services, such as many of those in Latin America, where land fields and water fields have to be used in alternation because some of the desirable stopping places have inadequate harbors, while others have no proper airports.

The transition from Mr. Sikorsky's paper to that of Juan T. Trippe, president of Pan American Airways, Inc., was logical, for Mr. Trippe's company makes much use of amphibions, and Mr. Trippe's paper (not actually read because of lack of time and the absence of the author) enlarged upon the advantages and drawbacks of doing so. The author said, in fact, that about one-third of all of Pan-American's flying to this time has been with amphibion types.

Recognizing the advantages of flexibility of the amphibion, previously referred to in reviewing Mr. Sikorsky's paper, Mr. Trippe was nevertheless concerned over the increased weight and decreased performance of the type as compared with the straight seaplane. Like Mr. Wright, he saw a distinct advantage in the decreased nervousness which passengers might experience when flying over water, where landing at any time would be possible. Another advantage, especially for backward countries, was the saving in the investment required for airway construction.

Mr. Trippe pointed out, however, that it was a mistake to think of the seaplane as requiring no airway or special provision of its own. It, too, needs organized bases and specially trained personnel. Proper runways, moorings, and fueling facilities for seaplanes are still rare in the United States. Mr. Trippe pointed out that companies operating overseas had to provide them at their own expense. One measure which, in his opinion, would greatly facilitate operation at terminals would be the provision of retractable landing gears for taxiing purposes only, so that flying boats might be driven into and out of the water under their own power without delay for attaching a wheel gear or putting them on a handling truck. Mr. Trippe appealed particularly for airplane manufacturers to give special and detailed study to the problems of the commercial flying boat.

THE CLOSING PAPER, also presented at the meeting by title only, dealt with the catapulting of aircraft from commercial vessels and came from Lieutenant W. M. Fellers, U. S. N. Lieutenant Fellers outlined the mechanical problems of catapult design and operation, and the Navy's experience in catapult operation. He called particular attention to the magnitude of the forces involved, the acceleration of the airplane running up to three times gravity during the launching, and the car then being checked with a negative acceleration of 100 times gravity. He laid special stress on the importance of a standard routine of operation, and of simplified mechanism, pointing out that the first catapults were very complex in design, while the control mechanism has now been simplified to the point where it is only necessary to throw a single lever to make the launching.

Returning to the commercial aspects, the author urged the practicability of ship-to-shore services, such as those already inaugurated by the French Line and the North German Lloyd on the Bremen. He gave as a reasonable hypothetical case a take-off 200 miles at sea, which would save from five to seven hours in delivering mail in New York, and furnish still larger benefits for deliveries in Paris and London.

Lieutenant Fellers foresaw no difficulty in increasing the size of catapults and in making them take care of passenger planes. He suggested, however, that the acceleration could probably be reduced when that was done, by the use of either a lower take-off speed of a longer run along the catapult track. From his extended experience he urged in conclusion that commercial operations with catapults should be undertaken with great care, and working out the special problems one by one. "Increase of range and load," he said, "should be made by small increments. As in all transportation, the motto should be Safety First"; and then, in further summary, "The problem of launching planes from commercial ships is one of procuring enough high-tariff traffic to offset the cost of operation, which will be high, even after every unnecessary expense has been eliminated. The physical problem of dispatching an airplane from the deck of a ship has been solved."

GENERAL NEWS

England Wins Schneider Cup With Speed of 328.64 M.P.H.

Supermarines Take Race and Make Records

COWES (ENGLAND) — England once more is the proud possessor of the Schneider trophy, an achievement desired by the British aircraft industry almost above everything else in the aeronautical world. It is the second British victory in as many Schneider events; the cup was taken from the Italians in 1927 and was defended against the Italians this year.

Flying Officer Henry R. D. Waghorn won the event Saturday, Sept. 7 by flying the seven laps of the course (217.38 mi.) at an average speed of 328.64 m.p.h. He piloted a Supermarine Rolls Royce S-6, a descendent of the Supermarine Napier used to win two years ago and which finished forth (it was given third place through Atcherley's disqualification) this year. [A description of the Supermarine S-6 may be found on page 495, issue of August 31.—ED.]

The speed of Waghorn's plane was about 47 m.p.h. faster than that of Flight Lieutenant F. N. Webster when he won the race only two years ago in the then record time of 281.488 m.p.h. His speed, in turn, was 34.99 m.p.h. better than that achieved by Major De Bernardi to win the 1926 event at Hampton Roads.

Atcherley Sets Two Records

Waghorn shared this year's honors with his team-mate, Flying Officer R. L. R. Atcherley, who established two new records for the 100 km. (62.137 mi.) closed course and the 50 km. (31.068 mi.) with average speeds of 331.75 and 332.49 m.p.h., respectively. He used another Supermarine S-6. These are the fastest officially credited speeds ever flown. [As AVIATION goes to press plans are being made by both Italian and English teams to better these marks.—ED.]

Atcherley was disqualified for failing to turn one of the pylons correctly so second place went to Quartermaster Tomaso dal Molin, who piloted a Macchi-Fiat M 52 over the course at the average speed of 284.20 m.p.h. Third place was won by Flight Lieutenant d'Arcy Greig, who was clocked at 282.11 m.p.h. Both the Italian machine and Greig's Supermarine S-5 had been flown in the 1927 race.

Lieut. Giovanni Monti, flying one of the new Macchi-Fiat M 67 racers, covered the first lap at 301.47 m.p.h. but he was forced to land when a water pipe broke. Lieut. Remo Cadringher, flying the other new Macchi, covered one lap at about 284 m.p.h. when he was forced to land by engine trouble. He was blinded by smoke from the exhaust and an accident was averted only by a narrow margin.

The navigability and seaworthiness tests were passed by all six machines on Friday, Sept. 6. Those tests consisted of anchoring the seaplanes for 6 hr. without anyone being allowed near them and then three series each of taxiing, take-off and landing.

Originally four teams had been expected to compete, the other two being France and the United States. France withdrew following the death of a racing pilot in training and on the plea that its planes could not be prepared in time. The United States was eliminated by failure of flight tests of Lieut. Alford J. Williams' Mercury racer. The English Gloster-Napier 6 was not flown.

[Complete details of the machines, the pilots and the contest written by our London correspondent will appear in an early issue of AVIATION.—ED.]

Pitcairn Gets Cabin Autogiro

PHILADELPHIA (PA.)—Pitcairn-Cierva Autogiro Company has received a French Autogiro which is the one to be entered in the Guggenheim Safe Aircraft Contest. It is the first cabin type manufactured, seating three passengers and pilot. It is reported that a connection between the rotors and the engine will be effected enabling starting of the blades with aid of the power plant.

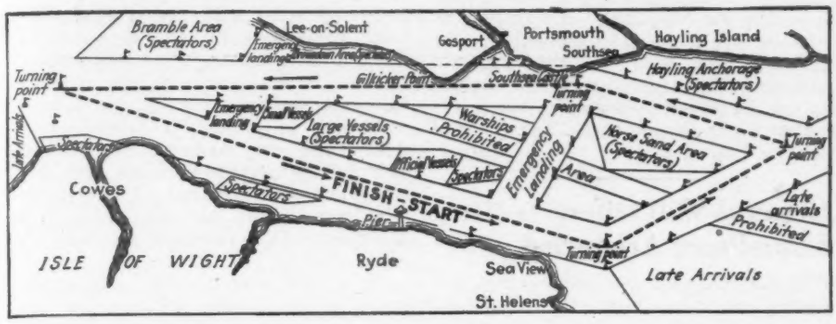
Chinese Government May Buy Planes Here

WASHINGTON (D.C.)—Shipment of airplanes to China will be permitted by the State Department provided that the Chinese legation here certifies that they are destined to go to the Nationalist Government. It is reported that the Nationalists are in the market for $1,250,000 worth of planes, but this could not be confirmed at the legation's office. It was stated that to date no orders have cleared through that office and that the legation has not received any advices from China concerning the purchase of aircraft, either for military or commercial purposes. A cable to the Department of Commerce from Shanghai states that American manufacturers are participating in the attempt to get the orders reported to be forthcoming.

The arms embargo, under which the world powers agreed not to sell military equipment to China, was lifted last spring, but when the threat of hostilities with Russia arose there was some doubt whether the State Department would permit domestic manufacturers to furnish planes to China. Inasmuch as the Department has decided that American manufacturers may ship planes, an important part of the business is expected.

Flown to victory by Waghorn—the Supermarine Rolls Royce S-6

The Layout of the Schneider Race Course



THIS DESCRIPTIVE MAP of the Cup Race site shows in detail the placement of the start and finish points, the pylons, emergency landing tracts, and areas for officials and spectators.

Van Orman's Race Balloon Nearly Ready

AKRON (OHIO)—The new 80,000 cu.ft. free balloon that Ward T. Van Orman and his aide, Allen MacCracken, will fly in the Gordon Bennett Balloon Trophy race from St. Louis on Sept. 28 is nearing completion at the Goodyear factory here. The balloon will be called the "Goodyear VIII." It represents 17 yr. of experience on the part of the company in building and flying balloons. The bag will wear the conventional white coat with blue letters. It is being equipped with the lightning shield, perfected early this year by Van Orman.

There will be three United States entries in the international event. Lieut. T. G. Settle, Navy No. 1 pilot, and Capt. E. W. Kepner, U. S. Army, will be the other two entrants. Countries participating will include England, France, Belgium, Germany, Switzerland, Spain, Italy and one South American country.

During the race, Van Orman will use another of his recent developments—a chart that simplifies the task of calculating the balloon's position from sextant readings. Formerly 20 min. or more time was required, but the new method reduces the period to 2 or 3 min.

Knut Eckener to Goodyear

AKRON (OHIO)—Knut Eckener, son of the commander of the Graf Zeppelin, will join the Goodyear-Zeppelin staff here this fall, according to an announcement by P. W. Litchfield, president of the Goodyear company. Mr. Eckener was coming to the United States to join the company late last spring on board the dirigible when it was forced back.

Kinner Ships 301 in August

LOS ANGELES (CALIF.)—A new monthly production record of 301 engines shipped during the month of August has been set by Kinner Airplane and Motor Corporation. The previous record for this company was 142 engines.

Consider N.A.A. Race Control

CLEVELAND (OHIO)—Announcement is made by Maj. Luke Christopher, secretary of the National Aeronautic Association, that this body will consider taking over events at all future national air races. Management of the races would supersede control by local committees in cities where the races are held.

New Fokker DT-32 Is Tested at Teterboro

TETERBORO AIRPORT (N. J.)—Initial test flights of the DT-32 four engined transport monoplane designed and built by Fokker Aircraft Corporation division of the General Motors Corporation were conducted here recently. The airplane, which is to have accommodations for 32 passengers, was flown by Test Pilot Hughie Wells. It is powered with four Pratt & Whitney Hornet engines in twin tandem.

In construction the DT-32 is similar to other Fokker transport planes. The engines are mounted back-to-back in pairs at either side of the fuselage, which is rounded at the nose, resembling a bomber. The pilot's compartment is in the upper portion of the fuselage near the nose. Double rudders are employed, one being in the slipstream of each pair of propellers. Two blade propellers are used on the front engines and three bladed on the rear.

Varney Tests Cyclone Stearman

BOISE (IDA.)—A test with a Varney firm Wright Cyclone powered Stearman mail plane has just been completed here, the craft having been flown long hours each day for two weeks covering some 30,000 mi. with the engine being operated at high speeds. No attempt was made for sustained flight, the plane having been landed regularly for refueling and to change pilots. The test was made, it was stated, to try out the Cyclone powered Stearman craft prior to use on the Varney Pasco-Salt Lake City mail line.

Ten Entrants Seek Gordon Bennett Cup

Balloonists From Six Nations Take Off Sept. 28

ST. LOUIS (MO.)—Ten balloons are being groomed for the eighteenth international Gordon Bennett Trophy Race which will start here Sept. 28. Three will represent the United States, attempting to repeat the American victories of the past three years, while Germany and France each have two entrants, and Belgium, Denmark and the Argentine have one apiece. Maj. Albert Bond Lambert is chairman of the technical committee of the race, which will begin at Scott Field.

The American entrants are: Capt. W. E. Kepner, pilot, and Lieut. W. O. Erickson; Lieut. Thomas G. W. Settle, pilot, and Ensign Wilfred Bushnell; Ward T. Van Orman, pilot, and Allen MacCracken, aide. Captain Kepner is entered as a result of his victory in last year's race, while Lieutenant Settle and Mr. Van Orman won first and second, respectively, in the elimination race which started from Pittsburgh May 30.

This year's race will be for the first leg on the third Gordon Bennett Trophy, the first having been won by Belgium with victories in 1922, 1923 and 1924, and the second by the United States, which has won the last three contests. Ernest Demuyter, who will represent Belgium again, has won the race four times and Van Orman has won twice. The United States has won seven of the seventeen contests for the trophy, while Beligum has won five.

The balloons will be filled with a special illuminating coal gas refined to give maximum lifting power, which will be furnished by Lackede Gas Light Company. A six-inch pipe will be run from the company's tank adjacent to the field at 8900 South Broadway, and with a pressure of seven pounds this will furnish 100,000 cu.ft. of gas per hour. The first balloon is not scheduled to leave the field until 4 p.m., but inflation of the bags will begin at 7 a.m. and continue until the start. It is estimated that 1,000,000 cu.ft. of gas will be required.

Approve Four More Planes

WASHINGTON (D. C.)—Approved type certificates were issued to four planes during the week ending Sept. 7, as follows: No. 219 Keystone-Loening Commuter, 4-place amphibion biplane, Whirlwind Nine, 1,220 lb., 4,000 lb.; No. 220-Curtiss-Robertson Robin J-1, three-place convertible land-sea cabin monoplane, Edo De Luxe floats, Whirlwind Five, Land: 898 lb., 2,440 lb., Sea: 870 lb., 2,660 lb.; No. 221-Curtiss-Robertson Robin J-2, three-place cabin monoplane, Whirlwind Five, 1,035 lb., 2,600 lb.; No. 222-Fokker F-XI-A, eight-place amphibion monoplane, Cyclone, 2,430 lb., 6,900 lb.

Kansas City Meet To Open Next Week

Show Receives Sanction; Exhibitors Are Announced

KANSAS CITY (MO.)—Prizes aggregating $50,000 are offered to winners of the 31 events on the program of the International Air Circus, Exposition and Pilots' Reunion which will be held here Sept. 21-29. The feature event is an International Air Derby from Mexico City, starting Sept. 23 and arriving Sept. 26, open to both men and women pilots. There will also be a "Heart of America" race, starting from Minneapolis, Minn., Denver, Colo., Cincinnati, Ohio, and San Antonio, Texas, and ending at the Fairfax Airport here.

A unique characteristic of the exposition is that will be held in hangars at the airport, instead of in some hall or euditorium remote from the flying activities. Display space of more than 110,000 sq.ft. is available for manufacturers' exhibits. A further advantage is that planes can be flown to the field and taken to the exhibition spaces provided for them without being "knocked down."

A large number of leading pilots have signified their intention of entering the derbies, races, or both. These include: Col. Arthur C. Goebel, Capt. Frank M. Hawks, Charles W. Holman, Clarence Chamberlin, Capt. Eddie Rickenbacker, William S. Brock, Capt. Jack Bursey, R.F.C., Barney Zimmerley, and many others. Captain Rickenbacker will fly to the field in the new DT-32 Fokker 32-place transport, the largest plane which has been built in the United States.

Revised to Meet Chamber Policy

Sanction for a Class C show has been granted by the Show Committee of the Aeronautical Chamber of Commerce. As previously announced, this sanction was at first withheld, but arrangements for the exposition and races were revised to conform to the policy of the Chamber, and will thus be given under official supervision.

Exhibitors who have reserved space in the Exposition are as follows:

National: Fokker Aircraft Corporation, Phillips Petroleum Company, Firestone Tire & Rubber Company, Standard Oil Company, Michigan *Air Travel News*, Kendall Oil Company, Nicholas-Beazley Airplane Company, Universal Aviation Corporation, Curtiss Flying Service, *Air Transportation*, Chicago Screw Company, Aircraft Safety Devices, Inc., Airport Lighting, Inc., Boeing Aircraft Corporation, Fridley & Bryant, *Aero Mechanics*, *Western Flying*, Simplex Aircraft Corporation, Esskey Hangar Door Company, Golden Eagle Airplane Company, Lytel S. Adams Air Mail Pick-Up Devices, Inc., Arrow Airplane and Motors Corporation, Lincoln Aircraft Company, Geo. D. Wanner & Company, Balsa Wood Company, Summerill Tubing Company, Metallurgical Laboratories, Metal Craft Corporation, Snap-On Wrench Company, *Aero Digest*, Pitcairn Aviation Corporation, Yellow Cab Airways, Guardian Aircraft Corporation, Goodyear Tire & Rubber Company, Cessna Airplane Corporation, Mono Aircraft Corporation, Waco Aircraft Company, Detroit Aircraft Corporation.

Local: American Eagle Aircraft Corporation, Inland Aviation Corporation, Barber-Rusto Corporation, National Aircraft Welding School, Tex LaGrone Flying School, Reid Sales Corporation, *Aircraft Age*, Curtiss Flying Service of the Midwest, American LaFrance-Foamite Corporation, Saunders Fly-It-Yourself Company, Kansas City Aircraft Company, Art C. Goebel School of Flying, Sunray Neon Company, Willard Battery Company, Butler Manufacturing Company, Rearwin Aircraft Corporation, Sterling Radio Company, Sewell Paint and Varnish Company, Holcker Mfg. Company, Murray Electric Company, Bennett Airways, Fairfax Airport, Woods Brothers Corporation, Bird-Wing Airplane Company, Clark & Guinotte, Feeney-Kendall Oil Company.

Pioneer Offers "Air Log"

BROOKLYN (N. Y.)—Automatic recording of air distances flown is furnished by the "Air Log," now offered by Pioneer Instrument Company. The indicator is made to the standard mounting dimensions recently adopted by the Society of Automotive Engineers for all flight instruments. The price of the Air Log is $150.

General Will Offer Four-Place Aristocrat

BUFFALO (N.Y.)—Besides the new models introduced at the Cleveland Show, General Airplanes Corporation, this city, will shortly offer a four-place Aristocrat cabin monoplane. This craft, to be powered with either a 225 hp. or 300 hp. Wright engine, will be placed on the market on or about Oct. 1.

According to George A. Townsend, secretary of the General organization, this plane has been designed for training schools and business executives needing a fast enclosed cabin type of plane, combining the maximum in speed, comfort and safety. He explained that new Department of Commerce regulations made it necessary for all training schools to give students secondary training in cabin ship flying, and it was to meet this requirement, that the new de luxe four-place Aristocrat was originally designed.

New models shown at Cleveland were the Geared Hornet mail plane model 107 and the "Sportabout" two-place open cockpit training machine. The Whirlwind Five Aristocrat was also displayed.

Nebraska Tour Underway

OMAHA (NEB.)—With a score of planes entered as we go to press, the Nebraska Air Tour was scheduled to take off here Sept. 9 to visit fifteen of the state's towns in a six-day trip. Among the entries are: Pioneer Aircraft Company, Omaha, two Wacos and a Cessna; Rapid Airlines, Omaha, two Ryans, a Ford and an Eaglerock; Omaha Airways, Inc., a Curtiss Robin; Mid-West Aviation Corporation, Travel Air cabin and Travel Air biplane; Fleetcraft Airplane Corporation, Lincoln, Fleetcraft biplane; Overland Airways, Omaha, Overland Trainer; Lincoln Aircraft Company, Lincoln "PT" Sport; Shaffer Oil and Refining Company, Fokker; Skelly Oil Company, two Spartans; and Arrow Aircraft and Motors Corporation, Havelock, two Arrow Sports.

General Aircraft Plans Absorption of Maximum

LOS ANGELES (CALIF.)—Plans have been announced for the formation of General Aircraft and Finance Company to absorb Maximum Safety Airplane Company through an exchange of stock, according to James McDonnell, president of the latter concern. Mr. McDonnell will be president of the new company and will continue to operate the Maximum Safety Airplane Company as a separate division of the General Aircraft group.

It is said that a large contract for training and military airplanes has been signed by officials of Maximum Safety Airplane Company and representatives of a South American republic. Several experimental planes of novel design have been constructed and test flown by Maximum Safety Airplane Company, features including very light wing loading, sharply tapered wings, high dihedral angle, and placing of the pilot's cabin high above the wing, which was of monoplane type in all models. Planes of low and high wing type have been tested. All models have been of the enclosed cabin type.

General "Sky Fleet" Visits K.C.

KANSAS CITY (MO.)—The fleet of eight Aristocrat monoplanes of General Tire & Rubber Company, now on a 50,000 mi. tour of the United States, Canada, Mexico, and Cuba, arrived at Fairfax Airport here recently for a four-day stopover. Pilots of the planes, all former Army men, are: Maj. C. H. Maranville, commander, Lieut. Harold K. Black, Lieut. Horace J. Reid, Lieut. Muri Estes, Lieut. Alfred Kalberer, Lieut. Robert K. Giovannoli, Lieut. Stanley B. Harvey, Lieut. A. C. Lybarger, and Lieut. Sheldon B. Yoder. In addition to advertising General tires, the planes are engaged in gathering operation cost data about airplanes in commercial service.

Plan Show For Legionnaires

LOUISVILLE (KY.)—In addition to fixed and mobile exhibits which will be furnished by the War Department and the Navy Department, a civil aviation exposition will be held in connection with the National Convention of the American Legion, this city, Sept. 30-Oct. 3. Two tents will be erected for this purpose on the airport here. Mr. F. Tryon Mengel is chairman of the aviation committee for the convention. The Aeronautical Chamber of Commerce is in sympathy with the exhibit.

Aircraft Plywood Plans Plant

SEATTLE (WASH.)—Aircraft Plywood, Inc., plans to begin construction of a plant in this city in the near future. The plant is to include three buildings at an approximate cost of $125,000, and is expected to be ready for production within a short time.

Local Firms May Use U. of Wichita's Tunnel

WICHITA (KAN.)—The new wind tunnel of the aeronautics school of the University of Wichita has been offered commercial aircraft builders of Wichita for testing purposes. The tunnel was designed by A. N. Petroff, director of the school, and built by students of the school. A 60 hp. electric motor is being installed to drive a four blade type propeller furnished by the U. S. Navy.

The tunnel is a Venturi open type. The air shaft is 60 ft. long with the intake cone opening 9 ft. in diameter. The outlet cone has an opening 8 ft. wide at the propeller end. In the center is the test chamber where both cones narrow to a diameter of 4 ft.

The chamber is an airtight compartment with a 5 ft. spread between cone ends and is 12 ft. high and 10 ft. long. The propeller will draw a 90-m.p.h. gale through the chamber.

New Pitot-Static Tube Offered

NEW YORK (N. Y.) — Consolidated Instrument Company announces development of a new type pitot-static tube specially designed for monoplane wing mounting, with strong construction and rigidity features of the device. Great accuracy was shown, officials state, when the tube recently was given a wind tunnel test at the Guggenheim school, New York University. Aircraft Control Corporation, Philadelphia, a division of Consolidated Instrument Company, is the manufacturer. [A full description of the tube will be carried in the Buyers' Log Book section of an early issue—ED.]

Much Dusting Activity in South

NEW YORK (N. Y.)—Great activity in dusting in the South, especially in Texas and west of the Mississippi, is reported in a letter received here, authoritative advices saying that almost all of the dusting firms have had more business than they can handle. One organization is said to have had a gross income of approximately $700 per plane per day since early Spring. Approximately 500,000 acres are being treated.

Dayton Takes New Offices

NEW YORK (N. Y.)—With the leasing of the thirtieth floor of the Chanin Building to Dayton Airplane Engine Corporation, the number of aviation firms who have taken space in the building is increased to ten. The Dayton company will use the offices for its executive and sales forces.

"Cabinaire" Offered With J-6

SAGINAW (MICH.)—Paramount Aircraft Corporation's "Cabinaire" light four-place cabin plane is now offered, it is announced here, with the Wright Whirlwind Five.

Soo Orders 25 Great Lakes

CLEVELAND (OHIO) — Twenty-five Trainers, planes manufactured by Great Lakes Aircraft Corporation here, have been sold to Soo Skyways of Sioux Falls, S. D., it is announced. Soo Skyways will be Great Lakes distributor in eastern South Dakota. The Trainers will be powered with American Cirrus engines.

Allied Aviation Reports May 1-July 31 Production

MOLINE (ILL.)—Production of 75 planes and 85 M-5 engines during the period from May 1 to July 31 is reported by Allied Aviation Industries. The planes included 36 Monocoupes, 27 Monopreps, seven Monosports and five Monocoaches. Orders on hand as of Aug. 15, with deposits, amounted to 23 planes valued at $52,481.25 and 65 M-5 engines valued at $54,120. Their value was given as $244,611.02 for airplanes and $122,911.69 for engines, making the value of total sales for three months $367,522.71.

Schedules for production have been increased, and now call for five Monocoupes, twenty Monopreps, six Monosports, and twelve Monocoaches per month. This represents an increase of 72 per cent over the first three months.

Airtech Buys Ten Fleets

BUFFALO (N. Y.)—Ten Fleet training planes have been ordered from Fleet Aircraft, Inc., by Airtech School of Aviation, San Diego, Calif. At the same time, San Diego Air Service Corporation, holding company for the Airtech school, has been appointed distributor for Fleet Aircraft in Southern California. The Fleet company is a division of Consolidated Aircraft Corporation. The training planes carry Kinner power.

Fleetcraft Tests Model A

LINCOLN (NEB.)—Fleetcraft Airplane Corporation, this city, recently completed test flights on the Fleetcraft Model A two-place open sport plane, designed to sell for less than $3,000 with 65 hp. engine. A biplane, the Model A has an upper wing span of 27½ ft. and lower of 24 ft. Seats are in side-by-side arrangement. J. B. Moore heads the firm, which plans a factory offering 50,000 sq.ft. of floor space.

Planes to Pursue Rum Runners

DETROIT (MICH.)—Prohibition enforcement by airplane is being planned by Walter S. Petty, Collector of Customs here. If they are found to be in satisfactory condition, two planes recently confiscated from run-runners may be made the nucleus of a force which would be expected to add materially to the efficiency of enforcement in this vicinity.

American Eagle Tour Planes Visiting in East

CLEVELAND (OHIO)—The American Eagle firm air tour, a flight of six of the company's planes, has been continuing its journey through the East with stops, following Cleveland, at Erie, Pa.; Jamestown, Angola, Buffalo, Syracuse, Binghamton and Albany, N. Y. The planes, which initially flew from Kansas City to Cleveland to visit the National Air Races, will make calls on American Eagle dealers and distributors in the New England states before returning to the Middle West.

In the tour are six planes and the pilots include Mae Haizlip, one of the contestants in the Santa Monica-Cleveland women's derby, and Larry D. Ruch, American Eagle's chief test pilot. Other pilots are Marvin Jornby, Ed Bowen and Charles Blosser. Accompanying the tour are H. S. "Jack" Lowe, a district sales manager, and Erle H. Smith, advertising manager for American Eagle Aircraft Corporation.

Car Dealers to Sell Spartans

TULSA (OKLA.)—Spartan Aircraft Company, this city, inaugurating a sales campaign, has turned to automobile dealers and distributors to place Spartan planes on the market. J. W. Brownlee, of J. Brownlee, Inc., automobile dealer at Shreveport, La., has been added to the sales department. Brownlee will tour the south placing Spartan agencies with automobile distributors. The company, a subsidiary of Skelly Oil Company, will also put planes in the dealer's display windows.

Waco Orders Consolidateds

NEW YORK (N. Y.)—Order by the Waco Aircraft Corporation, Troy, Ohio, for 200 special custom-built Consolidated Instrument panels, is reported here. This order is stated to approximate $25,000 in value. The panels include air speed indicators, tachometers, altimeters, oil temperature and oil pressure gauges, magneto and navigation light switches and the new Consolidated Turn & Bank Indicators.

Mock To Aid Heinkel

NEW YORK (N. Y.)—Richard M. Mock, Bellanca Aircraft Corporation engineer, left for Germany Sept. 12 to be associated for a time with the Heinkel company in design work. Mr. Mock, who was formerly technical editor of AVIATION, has received a leave of absence from the Bellanca firm.

Insurance for V-H Students

ST. LOUIS (MO.)—The Von Hoffmann Aircraft Company have made arrangements for insurance for their students. This insurance can be obtained at the field when the students enroll for their training.

Announce Traffic Meeting Program

Airline Officials Confer At Kansas City Sept. 16-18

KANSAS CITY (MO.)—Development of increased mail and passenger traffic over air transport lines will be the general subject considered at the National Air Traffic Conference of the Aeronautical Chamber of Commerce which will be held here Sept. 16-18. The conference was called by Frederick B. Rentschler, president of the Chamber, and Col. Paul Henderson, president of American Air Transport Association, with the object of securing greater coordination in the efforts of the various transport companies.

The three-day conference will open at noon, Sept. 16, with a luncheon session. Mayor Albert I. Beach will deliver an official address of welcome, and the response will be by Charles L. Lawrance. Col. Halsey Dunwoody, Universal Aviation Corporation, will also speak at the luncheon.

Committees to Study Problems

Col. Harry H. Blee, of the Department of Commerce, will open the afternoon session with an address on "Air Transportation: Its Inception, Development and Present Status." James G. Woolley, vice-president in charge of traffic, Western Air Express, will address the conference on "Traffic: the Foundation of Air Transport." T. B. Clement, T.A.T., will review the problems which confront the transport companies and tell how the conference proposes to study them. Charles L. Lawrance will appoint committees to study the problems at the second day's session and report on the third day.

Erle P. Halliburton, S.A.F.E., will open the morning session of the Sept. 17 conference with a talk on "Rate Making and Operating Costs." Maj. Gen. John F. O'Ryan, Colonial Air Transport, will preside at the session which will be devoted to a discussion of efficient methods to sell air traffic.

To Discuss Sales Programs

Short talks on sales programs developed by the major transport lines will be delivered by: J. T. Whitelaw, Standard Air Lines; J. N. Knappenberger, Yellow Cab Airways, Inc.; J. M. Eaton, Pan American Airways; Ralph S. Westing, Pitcairn Aviation, Inc.; Charles S. "Casey" Jones, Curtiss Flying Service; Sumner Sewell, Colonial Airways, Inc.; J. W. Brennan, T.A.T.; Thomas Wood, Jr., Western Air Express; W. A. Patterson, Boeing System; Walter T. Varney, Varney Air Lines; W. A. Letson, United States Airways; H. J. McNally, Universal Air Lines System, and R. W. Ireland, N.A.T.

City Manager H. S. McElroy, of Kansas City, will speak at the noon-day luncheon session. Representatives of Chambers of Commerce on the major air transport lines will attend a special afternoon session designed to study the place of municipal chambers of commerce in air transport development. Lou E. Holland, executive manager of the Kansas City Chamber of Commerce, will preside.

Col. Paul Henderson, T.A.T.; W. G. Herron, Air Investors, Inc., Col. L. H. Brittin, of Northwest Airways, and P. G. Johnson, Boeing System, will be speakers at the Chamber of Commerce session. Committees on airports, accounting, communications, publicity and advertising, facilities for handling passengers, ticket sales and solicitation, standard baggage weights, insurance, and methods of developing air mail and express traffic, will be in session at the same time.

Ralph H. Higgins, N.A.T., will be the speaker at the airport committee session, which will be presided over by C. C. Cole, Western Air Express. Herbert Hoover, Jr., Western Air Express, will be chairman of the conference on communication and radio, at which Thorp Hiscock, Boeing Air Transport, will be the speaker. Publicity and advertising and its relation to increased traffic will be discussed by Harold Crary, Boeing System, at another session, with R. A. Bishop, Universal Air Lines, as chairman.

Paul Goldsborough, Universal Air Lines, will talk on "Treatment of the Passenger and its Relation to Increased Traffic" at a session on facilities for handling passengers.

Amelia Earhart, T.A.T., will be chairman of the committee session on ticket sales and solicitation, with J. M. Eaton, Pan American Airways, as the principal speaker. King Young, S.A.F.E., is chairman of the committee on standard baggage weights, which will hear H. W. Beck, T.A.T., as its principal speaker. The relation of insurance to increased air traffic will be discussed by Lester D. Seymour, of N.A.T., at a special session on insurance, which will be presided over by H. J. McNally of Universal Air Lines. R. W. Ireland, N.A.T., will discuss the problems connected with the development of air mail traffic and Sumner Sewell will speak on air express traffic problems at a joint committee session to consider methods of developing air mail and express traffic.

A banquet will be attended by all the delegates Tuesday evening, Sept. 17, at which Col. Paul Henderson will be toastmaster. Speakers will be Edward S. Evans, Detroit Aircraft Corporation, William P. MacCracken, Jr., and Senator Hiram Bingham. The nine committees will make their reports at a general session Wednesday morning, with C. W. H. Smith, Western Air Express, as chairman. They will be further discussed at a final afternoon session to be presided over by Stanley E. Knauss, Stout Air Lines.

Imperial Plans International Race

TORONTO (CAN.) — Informal announcement is made by C. O. Stillman, president of Imperial Oil Company, that his firm is contemplating a contribution of $50,000 for the purpose of promoting an international race event to be called "The Imperial Air Derby." It is suggested that this race be initially flown next year and that it start at some important United States airport and finish at a Canadian field. The amount suggested for prizes would be worthy to attract premier foreign pilots as well as those of the Dominion and United States.

Nine Papers Exchange News Via Airline Service

LOS ANGELES (CALIF.)—An aerial exchange news service has been inaugurated by eight newspapers in conjunction with the Los Angeles *Times*, of this city. By the new service the papers exchange early editions over the airlines and reprint in a special column on the following day news items of interest from the various papers with which the change is effected. This makes it possible to publish certain news items which are not considered important enough to go on the wires for telegraphic transmission, but which can be printed while the item is still fresh by means of the airplane service.

Papers co-operating in the new news service are: The Los Angeles *Times*, the Salt Lake *Tribune*, Washington *Evening Star*, The Indianapolis *News*, Kansas City *Times*, Kansas City *Star*, The Arizona *Republican*, Chicago Daily *Tribune*, and Albuquerque *Journal*.

Mid-Continent Gets Fokkers

LOS ANGELES (CALIF.) — Three Fokker passenger planes, of an initial order of seven, recently were officially delivered to the Mid-Continent Air Express by the Aero Corporation of California, Inc., distributor for Fokker aircraft. The new planes are to be used on the Mid-Continent Air Express line between El Paso, Tex., Denver, Colo., and Kansas City, Mo., which is expected to be put into operation within the next few weeks.

Ryan Summer Sales $302,078

DETROIT (MICH.)—Ryan division of Detroit Aircraft Corp. sold $302,078 worth of planes, engines and other equipment in the period from June 1 to Aug. 28, it is announced by Edward S. Evans, president. This total includes 27 standard and specially equipped planes as well as other aircraft parts and engines.

Company Will Use Blimp Commercially

NEW BEDFORD (MASS.)—A company is to be incorporated shortly as "New England Airship Company," which has contracted with the Goodyear-Zeppelin Corporation, Akron, for a baby dirigible similar to the "Mayflower," now operating at the Round Hill Airport, South Dartmouth. Announcement was made by Arthur G. Wadsworth, head of the syndicate with whom is associated the following: Thomas L. Andrews, president Andrew & Pierce Trucking Company, New Bedford; Paul C. Howes, South Dartmouth, investment broker; Joseph E. Nute, former manager of Fall River Gas Works Company; Joseph F. Mullen, jeweler, Fall River; Harry R. Sherman, farmer, Dartmouth; Myron S. Lawrence and Winston King, Dartmouth, automobile dealers; Raymond F. Davol, Dartmouth, merchant. The dirigible, to be used commercially, will be the first sold by Goodyear-Zeppelin Company to private interests. It will give New England the pioneer dirigible service of the United States. Delivery is to be made before May 1, 1930.

To Offer Barling With Genet and Velie

MARSHALL (MO.)—Barling NB-3 monoplanes equipped with either Genet or Velie power will be available shortly in addition to the stock model equipped with the Le Blond "60", it has been announced by officials of Nicholas-Beazley Airplane Company, this city, manufacturer of the planes. Specifications and performance figures have not been announced, but it is said that the Genet-powered Barling will have increased performance.

Production of the models will begin shortly. A new feature is a standard engine mount, which accommodates all three engines. Several other features have recently been added to the Barling which include a front control stick, quickly attachable and detachable.

Dealer and distributor contracts calling for more than one hundred planes have been reported placed within the past three weeks.

Postpone Boston Air Show

BOSTON (MASS.)—Sheldon H. Fairbanks, manager of the New England Aviation Exposition, announces that the fourth annual show, slated for Sept. 23-28 at the Boston Garden, has been definitely postponed until the end of the winter season.

Thirty Overlands Ordered

OMAHA (NEB.)—A single order for 25 planes and another for five, has been received by Overland Airways, Inc., this city. A. L. Head, Hagerstown, Ont., placed the large order.

D.A.C. Buys Long Beach Site

LONG BEACH (CALIF.) — Detroit Aircraft Corporation, it is announced, has purchased a 30-acre tract located at the municipal airport. A new plant, to be ready by February, will be erected on the site wherein all the activity of Lockheed Aircraft Company, D.A.C. division eventually will center. The Lockheed plant is now located at Burbank, Calif.

Arrow Firm Orders 100 Fairchild Genets

NEW YORK (N.Y.)—That a contract has been signed by Arrow Aircraft & Motors Corporation, Havelock, Neb., for 100 Fairchild Genet engines, is announced by A. A. Woodruff, Fairchild Airplane Manufacturing Corporation sales manager. Delivery on the $150,000 order for the 80 hp. five-cylinder air-cooled engines is to begin at once. The power plants will be used in Arrows being built for the Saunders Drive-It-Yourself system.

An order for twelve Genet engines has also been placed by the Nicholas-Beazley Airplane Company, Marshall, Mo., for use in Barling NB-3 planes. Barney Zimmerley established an altitude mark of 26,500 ft. flying a Genet Barling NB-3 at East St. Louis last May. National Air Race visitors will remember this plane which was flown by H. A. Speer in the All Ohio Derby.

Miami Maid Airplane To Be Given Static Tests

HIALEAH (FLA.)—In order to assure himself that his factors of safety are above Department of Commerce requirements, L. C. McCarty, Jr., designer of the "Miami Maid" is supervising the complete destruction of a plane of that type, making careful static tests on each part. Officials of the company say that the design will be changed as necessary to insure throughout a high factor of safety.

The Miami Maid is a four-passenger, full cantilever type flying boat. Production models will probably be powered with 260 hp. Menasco nine-cylinder radial engines, mounted with a pusher propeller. The hulls of the new models will be covered with duralumin, and will contain six separate water-tight compartments. Miami Aircraft Corporation, this city, is manufacturer.

Motor Row Becomes Airminded

CHICAGO (ILL.)—Possible establishment of an airplane center on the old automobile row on South Michigan Avenue is indicated by the leasing of a six-story building at the corner of 18th Street to Chicago Air Service, Inc. This is the second building in this district leased to aviation companies within a short tme by the same agent. The building will be used as a flying school and factory.

Braley School Opens New Student Dormitory

WICHITA (KAN.)—More than 6,000 persons visited the new dormitory of Braley School of Flying on the day it was opened here recently. Five hundred of them took advantage of the special rate of $1 a ride in planes flown by Braley pilots. Seven new students enrolled, bringing the total number now taking the course to 300, representing nearly every state in the United States as well as the Hawaiian and Philippine Islands, Canada and Mexico.

The new dormitory, 75 by 200 ft., has dining, lounge and club accommodations for 160 students. It is fireproof, and two stories high, with basement. An administration building with class rooms and hangar space has also been completed recently. In order to handle the present expansion program, the school is offering $250,000 in stock.

J. V. C. Gregory is general manager, E. E. Crumplar, sales manager, O. P. Harrah, operations manager. Other instructors are: J. H. Bridges, Harold Wynne, T. G. Stone, Fred Snavely, A. G. Schlegel, F. H. Johnson, S. B. Fishburne, Wayne Redburn, C. C. Wilcox, John MacClaren and W. J. Husch.

Establish Southern Air Service Stations

NEW ORLEANS (LA.)—Service for engines and various types of aircraft is being established throughout the South by Southern Aeromotive Service, Inc., a division of Southern Air Transport. Sixteen shops are already in operation, and at seven of them complete service is available for Travel Air, Cessna, Curtiss Robin, Command-Aire, Fokker and Ireland planes as well as for engines.

Ultimately, the company intends to establish a service station at each division point on Southern Air Transport lines, according to "Pete" Taylor, manager of Southern Aeromotive Service. While these are intended primarily for the benefit of transport planes, they will also serve private pilots, including emergency service to distant points comparable to that furnished motorists by automobile repair companies. Southern Air Transport is a subsidiary of The Aviation Corporation.

Dominion Reports Imports

OTTAWA (ONT.)—According to returns of the Department of Customs and Excise, some 26 aircraft valued at $279,528 were imported into the country during the first quarter of the fiscal year. Air mail to the extent of 1,613 bags entered the country and 550 bags were passed through on outgoing trips. A total of 133 planes passed through customs inspection entering the Dominion, while those leaving Canada numbered 114. Passengers entering the country totaled 182, while those leaving the Dominion numbered 165.

Crown Firm to Erect Factory to Make B-3's

LOS ANGELES (CALIF.)—Immediate erection of a modern aircraft factory of approximately 40,000 sq.ft. floor space and equipped for quantity production of the Crown B-3 Kinner-powered three-place biplane has been announced by M. M. Brockway, Crown Aircraft Company official. Approved type certificate No. 199 was recently granted the Crown plane.

Originally known as the Kinner "Airster," this plane has been developed over a period of many years of actual test flying, each successive service in commercial flying. Manufacturing rights were sold by the Kinner Company in order to permit concentration on the manufacture of the Kinner K-5 engine. Hundreds of hours of test flying covering air routes of both the United States and Mexico have been given the test models built by Crown Motor Carriage Company. The Crown B-3 is of conventional open biplane type with accommodations for two passengers and pilot.

Manufacture of the Crown plane will be conducted by the Crown Aircraft Company, a division of Crown Motor Carriage Works, officers of which are: Z. S. Freeman, president, and M. M. Brockway, vice-president.

Another Great Lakes Addition to Be Erected

CLEVELAND (OHIO)—Another expansion of plant and production facilities to take care of increasing aircraft orders is announced by Col. Benjamin F. Castle, president of Great Lakes Aircraft Corporation this city.

Work on a 10,000-ft. addition will start shortly, Colonel Castle stated, and plans call for its completion in about six weeks. This is the second addition within three months.

The added space will be used for production of four-place, twin-engined amphibions, a new product that will go into quantity production shortly. Part of the space also will be utilized for building the eighteen three-purpose battle planes which the U. S. Navy ordered some time ago.

Wins Guggenheim Scholarship

DENVER (COLO.)—Paul C. Spiess, this city, has won the $1,000 scholarship to the Guggenheim School of Aeronautics, New York University. Spiess took the award with papers on "Height Above Ground Altimeters." He was a freshman at the University of Colorado last year.

Lang to Manufacture Parts

CLEVELAND (OHIO)—With an order for duralumin nose ends for wings completed for Great Lakes Aircraft Corporation, Lang Body Company, bus body builder, this city, announces its entrance into the aircraft parts field.

Plan State Air Body in Florida

JACKSONVILLE (FLA.)—Ralph G. Grassfield, general manager of the State Chamber of Commerce, is in Orlando this week to discuss with Lieut. E. C. Nilson, chairman of the state chamber's aviation division, plans for organizing a statewide aviation body upon which every town in Florida will be represented.

Air Industry a Leader Among Profit Gainers

NEW YORK (N. Y.)—Only five industries gained more in percentage of net profit for the first six months of 1929 over the corresponding figures for 1928 than did the aviation industry, according to figures compiled by the National City Bank. Of 36 industries reported, shipping was first with a gain of 179 per cent, and following in order were iron and steel, copper, petroleum, amusement, and aviation, which gained 66.2 per cent.

Six firms were taken as a basis for the figures given for the aviation industry. These reported total net profits of $12,522,000 for the first half of 1929 as compared with $7,546,000 for the same period in 1928. It is probable that the percentage of increase would have been greater if a larger number of air firms had been considered, since many of the smaller concerns which were depressed last year have showed marked gains in 1929.

Master Company Moving

WICHITA (KAN.) — Master Aircraft Corporation, organized some time ago by George R. Arbenz, of Wichita, to manufacture two types of airplanes at Enid, Okla., is moving its factory to Woodward, Okla. A two-place biplane for training purposes and a transport of eight passenger capacity will be built, according to Arbenz. The corporation will occupy a temporary factory until the city of woodward takes over a 160-acre airport for which voters of the town gave their approval recently.

Deliver Stearman Mail Planes

WICHITA (KAN.) — Stearman Aircraft Company, this city, has delivered four of the new mail and passenger transport planes to Robertson Airways for service between Louisville and Cincinnati. Four more are being built at the Wichita factory for other lines. The planes are powered with Pratt & Whitney Hornet engines.

Insure Garland Students

TULSA (OKLA.)—All students enrolled at the Garland School of Aeronautics will be insured without additional charge against accidental death and disability to the amount of $2,500 during the course of their training. The new system was made effective Sept. 1.

Supreme Propeller Moving to New Plant

WICHITA (KAN.)—Supreme Propeller Company will be turning out propellers in its new $60,000 factory building here by Sept. 15. Work on removing equipment from the old to the new factory has started. The new structure is the longest factory building in Wichita. It measures 75 by 312 ft. A balcony 20 ft. wide and circling the entire building forms a second story. It will be used for the finishing department.

The experimental department is being featured in the new factory. One end of the main factory room will be used for research and repair work. The company plans to develop a steel propeller to add to its line of wooden air screws.

A large aerial sign carrying "Supreme Propeller" in letters 20 ft. in height is being painted on the roof.

Aviation Financiers Form "Hangar" Club

NEW YORK (N. Y.)—A new club is being formed here by a group of men who have been interested in the financing and development of aviation from a business standpoint. It will be known as "The Hangar" and will occupy a new building to be erected at 34 and 36 East 63rd Street by Cross and Cross.

The following men constitute the board of governors of "The Hangar": H. B. Baker, J. G. Blaine, J. C. Cowdin, Eliot Cross, J. W. Cutler, H. P. Davison, Marshall Field, J. V. Forrestal, A. L. Gates, Robert Grant, Jr., G. B. Grosvenor, J. W. Hanes, W. A. Harriman, R. F. Hoyt, C. M. Keys, C. L. Lawrance, R. A. Lovett, G. M-P. Murphy, G. S. Rentschler, F. B. Rentschler, B. A. Tompkins, J. C. Willson, J. H. Whitney, C. V. Whitney.

Seed 160 Acres in 1 Hr. 40 Min.

BELLINGHAM (WASH.)—R. C. Graham, this city, recently seeded 160 acres of land on Lummi Island in 1 hr. 40 min. Seed was fed from Graham's plane in a 6 in. stream. Some eight hundred pounds of seed was used.

Love Won Ohio Derby With Davis

Error in an announcement of judges' time and lack of official figures caused incorrect publication of results in the All Ohio Derby of the National Air Races. Corrected, the winners and their times are as follows: First, Lewis "Pat" Love, Davis V-3, LeBlond, 4:43:15.6; second, H. A. Speer, Barling NB-3, Genet, 5:00:55.

BRIEFLY

During August there were 8,025 plane landings at the Oakland Municipal Airport, 6,203 passengers were carried and 1,565 student flights were made. These are records for the Oakland field.

Nearly 300 cities and towns have been air markeed in Ohio as a result of the National Air Races.

The name of the Commercial Aircraft Corporation has been changed to Commercial Aircraft Corporation, Ltd. It is located at Los Angeles Metropolitan Airport.

During the operation of the Ludington Cape Cod Airway service between Philadelphia and Wood's Hole, Mass., in the period July 3-Sept. 3, 101 passengers were carried by the Fairchild 71 and two Travel Air cabin planes used on the line.

The City of St. Louis has decided to operate the concessions at the Lambert-St. Louis flying field.

Canada will spend about $140,000 this year in the promotion of its chain of flying clubs.

Flying lessons are being given by radio over Station WRNY, New York City, under the auspices of the Roosevelt Flying School.

Air travel general information and ticket office has been opened in the Graybar Building, New York City, by the Western Air Express, operators of the New York-Los Angeles air-rail route.

International Tranportation Company, St. Louis, Mo., has purchased a tract in Montabello, Calif., for the erection of an airplane manufacturing plant, at a cost of $300,000.

Fairchild FC2W2 5-passenger Wasp powered monoplane, "Parker Duofold," has traveled 51,000 mi., visiting dealers in the past nine months.

Daily air travel has been started at Charlottesville, Va., by the Dixie Flying Service, Inc.

A two-passenger high-wing monoplane with folding wings is being marketed for $1,875, flyaway, by the Self Aircraft Company, of Wichita, Kan.

Gruss Air Spring Company will start operations this month in its new Los Angeles, Calif., factory, valued at $800,000.

Aviation engineering of every type, including experimental and special lot contracting, is being undertaken by the Alpaugh Engineering Company, Torrance, Calif.

The Philadelphia National Aeronautic Association Flying Club has received its first plane, a Travel Air 165 hp. biplane, for the use of its members.

Guy G. Thayer and associates of Portland, Ore., have invented and contemplate marketing an airplane motor called the "Aerobat" with 400 less parts than the average now in use.

Mid-Continent Air Express of Kansas City, Mo., has received delivery on three Fokker Super-Universals to be used as an air passenger service between Kansas City and Denver.

The air show scheduled for September in the Boston (Mass.) Garden has been postponed until spring.

An aviation committee to decide all questions pertaining to the municipal airport has been formed at Evansville, Ind.

Aero Corporation of California reports a total of 1,540 passengers carried during the last day of the Graf's visit to Los Angeles.

Dense smoke clouds being shown by the high winds and forest fires are hampering the operations of the Ontario Air Service Patrol.

Mid-South Aircraft Company, Inc., of Memphis, Tenn., plans the operation of a sales and distribution service in that city.

Aerial photographs taken of Mount Ranier by Capt. A. W. Stevenson and Lieut. J. A. Cockille, from a point 205 mi. south of the Three Sisters, have proved very successful.

There were 2,236 flights and landings from San Francisco's Municipal Airport, Mills Field, during July. The revenue for the month was $1,293.

The central airport at Camden, N. J., has been designated as an official stop on the New York-Atlanta air mail route.

Municipalities are not empowered by the law to create boards of control for municipal airports, but must be governed as public utilities, it was recently ruled by th Ohio Attorney General.

A charter service operating from Atlantic City airport using Bellanca planes was recently instituted by Delaware & Atlantic Aero Corporation.

Bremerton, Wash., air ferry operated between Navy Yard and Seattle, has carried 10,000 passengers since June 15, 1928.

Utica (N. Y.) Municipal Airport receipts for hangar rentals and ground fees during August were $724, bringing the total receipts thus far to $2,538.25.

Employees of the Kinner Airplane & Motor Corporation have formed a flying club.

Long distance radio communication over 530 mi. range was recently established by a Transcontinental Air Transport plane.

Mamer Air Transport, Spokane, Wash., will operate an air passenger service between Walla Walla and Salt Lake City, Utah.

A law providing for the ultimate scrapping of every antiquated plane in California, called an insurance policy for air passengers, was recently enacted by the California Legislature.

It is understood that the Travel Air company will soon establish an aircraft factory near Montreal, Que., co-operating with its sales agency, the Continental Aero Corporation. of Montreal.

TRADE TIPS

It has been reported that

Bids are being asked for the general contract for the construction of the Wayne County Airport hangar at Detroit, Mich., the building to be 434 x 128 ft. and the cost $350,000. Plans are being drawn also for a power house, a machine shop, a waiting room and a restaurant.

Bids are being asked for the construction of a power house at the Omaha (Neb.) Municipal Airport.

Pitcairn Aviation is considering bids for construction of hangars at Candler Field, Atlanta, Ga.

The Aero & Auto Engineering Company is reported to soon begin construction of an airport in Tampa, Fla., for both land and sea planes, adjacent to the 22nd Street causeway, bordered on the side by Hillsborough Bay. The development of this new project will cost about $100,000.

St. Petersburg, Fla., will soon call for bids for construction of two hangars at the Albert Whitted Airport, to cost about $55,000, one for airplanes and the other for a small airship. E. H. Lewis is director of public works.

Bonds for $35,000 have been voted by Natchitoches, La., for an airport.

Little Rock, Ark., has voted bonds for $200,000 for the purchase of a site, construction and equipment of airport.

Aircraft Industries, Ltd., is about to have plans prepared for a factory building to cost about $60,000, in Modesto, Calif., and will also open a flying school and operate a transport system between various cities in the San Joaquin Valley.

Neilson Steel Aircraft Company, Second and Camelia streets, Berkeley, Calif., has plans completed, and will soon let the contract for erection of a 60 x 200 ft. addition to its plant.

San Francisco Bay Airdome, Inc., has plans completed and will soon let the contract for construction of an administration building, with waiting room of 200-seat capacity, three steel hangars, etc., on its tract near the Estuary Tube, Alameda, Calif.

Representatives Named

NICHOLAS-BEAZLEY — Gorman Brothers Aircraft Division of Pennant Industries, 2262 59th St., Brooklyn, N. Y.; for Metropolitan New York.

WRIGHT — San Diego Air Service Corp., Lindbergh Field, San Diego, Calif.; sales and service.

GREAT LAKES—Capt. A. B. McMullen, Tampa, Fla.; for the states of Alabama, Georgia and Florida.

Soo Skyways, Sioux Faals, S. D.; for eastern South Dakota.

CURTISS—Brower Air Service, of Lindsborg, Kan.

AVIAN—Owen B. Jones, of Chicago.

FOKKER, HAMILTON, MAXWELL — The Aero Corporation of California.

PERSONNEL

ARTHUR W. KIMBELL has been elected general manager of the United-Carr Fastener Company, Boston, Mass.

E. D. RICE, recently of the Pitcairn Aviation, Inc., offices at Brooklyn, N. Y., is being transferred to Philadelphia as assistant to Geoffrey S. Childs, vice-president and general manager of the Pitcairn-Cierva Autogiro Company.

WILLIAM E. TELZROW has been appointed manager of the Cleveland Institute of Aviation, Inc., at the Cleveland (Ohio) Airport.

D. E. BRASTOW, formerly assistant manager of the Marshall Flying School, Marshall, Mo., has been appointed sales and advertising manager of the school.

JAMES R. LOWELL has been named publicity director for Arrow Aircraft & Motors Company, Lincoln, Neb.

CAPT. CARL B. SQUIER, formerly of the U. S. Air Service, has been appointed general manager of the Lockheed division of the Detroit Aircraft Corporation.

MAJ. R. W. SCHROEDER, general manager of Chicago Curtiss interests, has been elected president of the International Aviators' Club, recently organized in Chicago.

CARL S. REED has been elected president of the Fairchild Aviation Corporation to succeed SHERMAN M. FAIRCHILD, who has become chairman of the board and is also vice-president of The Aviation Corporation.

E. T. MCKEE will be in charge of aircraft equipment and accessory sales for the Curtiss Flying Service at Port Columbus.

R. S. BOUTELLE, formerly of the flight test department of the U. S. Army Air Corps at McCook Field, Dayton, Ohio, has been named chief inspector of the Spartan Aircraft Company, Tulsa, Okla.

O. R. HAUETER, assistant sales manager of the Alexander Aircraft Compan, of Colorado Springs, has been made vice-president of the Von Hoffman Aircraft Company to succeed the late George Lea Lambert.

S. T. KAUFMAN, of Kansas City, Mo., will be a mail pilot for the Aviation Exploration, Inc., operating between Shanghai and Hankow.

JERSEY RINGEL is field manager and chief pilot of the recently formed Southern Flyers, Inc., Chattanooga, Tenn.

GEORGE F. HARTWIG, JR., transport pilot formerly associated with Barber & Baldwin, has been appointed field service engineer for the Consolidated Instrument Company of America, Inc.

E. E. ROBERTS, formerly associated with the Stinson School of Aviation and the Lenert Aircraft Corporation, has joined the Ryan factory engineering staff of the Detroit Aircraft Corporation.

JAMES WORK has been appointed vice-president of the Detroit Aircraft Corporation. Mr. Work between 1922 and 1926 was chief engineer of the Naval Air Station at Lakehurst, N. J., and more recently assistant general manager of the Naval Aircraft Factory. LAWRENCE G. KING, magazine and newspaper feature writer, has been made assistant to the president.

L. C. NASH has been appointed assistant sales manager of the Haskelite Manufacturing Corporation of Chicago. C. E. SCOTT will be in charge of aircraft sales; and GEORGE I. FISCHER has transferred from the engineering department to advertising and sales promotion.

NORMAN G. SOUTHER, formerly of the Nicholas Beezley Flying School at Marshall, Mo., has been named business manager of the Spartan School of Aeronautics at Tulsa. Capt. A. K. NIMS will direct the flying activities of the students.

W. E. MANN has been elected president of the Palmetto Aero Club of Palmetto, Fla. LEVI COURTNEY is vice-president, and H. S. HUGHES, secretary-treasurer.

PHILLIP A. ROLL, first lieutenant in the U. S. Army Air Reserve Corps and chief pilot of the Airways Transport, Inc., will soon go to Maxwell Field, Montgomery, Ala., for a year of active serivce.

OLCOTT PAYSON has joined the staff of instructors of the Skyways School at Marstons Mills on Cape Cod, Mass.

RALPH WINSLOW BARNES, formerly of Akron, Ohio, is now in charge of the flying school of the Curtiss Service in Indianapolis.

NELSON E. JONES has resigned his post as vice-president and manager of Breese Aircraft Corporation of Portland, Ore., to join the Marine Aircraft Company, Sausalito, Calif.

AERONAUTICAL CALENDAR

Sept. 9-14	Nebraska Air Tour, auspices Omaha Chamber of Commerce.
Sept. 16-18	First National Air Traffic Conference, Muelbach Hotel, Kansas City, Mo.
Sept. 21-29	Class C Air Show and International Pilot's Reunion, Fairfax Airport, Kansas City, Mo.
Sept. 28	Gordon Bennett Balloon Trophy Race, St. Louis, Mo.
Oct. 5-21	National Air Tour, Starting from Ford Airport, Dearborn, Mich.
Oct. 12-27	Southwestern Aircraft Exposition, State Fair Grounds, Dallas, Tex.
Oct. 24-25	Conference on Municipal Airports at Washington, D. C., under auspices of the American Road Builders Association.
Nov. 18	Lehigh Airport Design Competition Closes. Lehigh Portland Cement Company.
1930 February	National Air Show, auspices Aeronautical Chamber of Commerce, St. Louis.
Feb. 5-12	New York Aviation Show, auspices Aviators' Post, American Legion.
April 5-13	All-American Aircraft Show, Detroit
May 3-10	New York Aircraft Salon, auspices Metropolitan New York Division, Distributor-Dealers Section, Aeronautical Chamber of Commerce, at Madison Square Garden, New York City.

New Firms Announced

STANDARD STEAM AND HOIST COMPANY, INC., New York; capital $50,000; by James T. Eason, M. Regina Perry, and Abram E. Berman; to manufacture aircraft machinery.

AEROMARINE AIRWAYS, INC., 120 Broadway, New York, N. Y.; capital 100 shares no par-value stock; by Pike P. Waldrop, Eugene T. McQuade, John W. DeWitt; to deal in aircraft.

JOE-BEN LIEVRE AIRCRAFT, INC., San Antonio, Tex.; capital $125,000; by Joe-Ben Lievre and others.

AERONAUTICAL CORPORATION OF CANADA, LTD., Winnipeg, Manitoba; capital 2,500 shares no par-value preferred stock; 5,000 shares of common no par-value tock.

FARINA AIRCRAFT CORPORATION, 690 Eighth Ave., New York City; capital $100,000; by Henry Farina, Frank M. Gould and Robert F. S. Harris; to build aircraft using new designs in wing, fuselage and landing gear.

FLORIDA STATE AIRWAYS, INC., of Jacksonville Fla.; capital of $30,000 with 3,000 shares of stock; by C. W. Sellick, Thomas Quinn and William Lindley; to repair and buy planes.

Schools and Colleges

SERGENT SCHOOL OF AERONAUTICS, division of the Great Northern Aviation Corporation, of Duluth, Minn., has opened a new flying school at Coleraine (Minn.) Municipal Airport.

MCMULLEN FLYING SCHOOL, Tampa, Fla., has done considerable plane rebuilding, recently having sixteen wings in the course of reconstruction.

MORAINE FLYING SERVICE, Moraine City, Ohio, has developed a club plan flying course.

ST. LOUIS-UNIVERSAL FLYING SCHOOL recently graduated the twenty students comprising its fourth mechanic's class.

PACIFIC SOUTHWEST AIRWAYS, Wichita, Kan., is being reorganized and will operate a flying school at the field now used by Buckley Aircraft Company and the Kinner Motor Company.

LOCUST GROVE INSTITUTE, Locust Grove, Ga., is to begin soon comprehensive flying courses for the three grades of pilot licenses.

PARKS AIR COLLEGE, East St. Louis, Ill., reports an increased enrollment in the transport course.

Starts Weekly Service

MINNEAPOLIS (MINN.) — Weekly airplane passenger service between this city and Superior, Wis., has been inaugurated by Head-of-the-Lakes Airways, Inc. A Ryan six-place monoplane, with Wright J-6 Whirlwind engine, is used.

Air Travel Bureau Busy

KANSAS CITY (KAN.)—A new high mark was established here August 30 by the Air Travel Bureau, when ticket sales through the bureau totaled $1,000.

AIRPORTS AND AIRLINES

Air-Rail Links Mexico and New York

NEW YORK (N.Y.)—By merely co-ordinating the schedules on existing train and air lines, an air-rail service has been arranged between this city and Mexico City, starting Sept. 8. Many other cities may benefit indirectly by the arrangement by virtue of connecting train and plane services branching off from the main line. It is expected that the all-train service time of about 100 hr. between here and the Mexican capital may be cut to about 68 hr.

This latest agreement in the air-rail system involves the New York Central and the Missouri, Kansas City and Texas railroads, the Universal Air Lines and Southern Air Transport (divisions of The Aviation Corporation), and the Mexican Aviation Company, a subsidiary of Pan American Airways.

Going south from this city a passenger would leave here at 5 p.m. on the Southwestern Limited of the New York Central, arriving at Cleveland at 6.30 a.m. the next morning. Leaving Cleveland at 7.10 a.m. on a Universal plane, the passenger would stop at Chicago between 9.05 and 9.45 for breakfast and at Kansas City between 1.50 and 3.10 for lunch. From Kansas City the passenger flies to Tulsa in a Central Air Lines plane (subsidiary of Universal) and arrives there at 6.40 p.m. At 11 p.m. he boards an over-night Missouri, Kansas and Texas train for Dallas, Tex., arriving there at 7.50 a.m. The next stage is by air to Brownsville, a trip taking from 8.30 a.m. to 3.45 p.m. There is an over-night stop here and the passenger goes by Mexican Aviation Company plane to Mexico City the next day, leaving at 8 a.m. and arriving at 1.45 p.m.

On the northbound trip the passenger leaves Mexico City on a Mexican Aviation plane at 7.45 a.m. reaching Brownsville at 12.55 p.m. and Dallas at 7.20 p.m. Leaving Dallas at 11 p.m. by train and arriving at Tulsa at 7.59 a.m., the passenger is able to leave the latter city 8.30 a.m. plane for Kansas City, where he arrives at 12.05 p.m. Cleveland is reached, by plane, at 7.45 that night and the balance of the journey is completed by train. The fare by train and plane is about $300 while the fare for through train service is about $143.

Canadian Air Travel Grows

OTTAWA (ONT.)—During 1928, airlines of the Dominion carried 74,669 passengers to various destinations, which represented an increase of between 1,500 and 1,600 per cent over the total carried four years ago. In 1925 the number of passengers carried by air totaled only 4,897.

Universal Air-Rail Operations

ST. LOUIS (MO.) — Cross-continent air-rail line operated by Universal Aviation Corporation, New York Central and Santa Fe Railroads, has been operating on a schedule negligably short of perfect during the first two months of service. Carrying more than 1,000 passengers during the above period, the combined system traveled 63,714 mi. in July and 62,410 in August.

Air Mail Increases In First Six Months

WASHINGTON (D.C.) — A total of $7,280,441 was paid the air mail contractors for carrying 3,468,562 lb. of mail 6,379,776 mi. during the first six months of this year, according to the Aeronautics Branch. Of this the 31 domestic carriers received $6,193,083 for carrying 3,142,652 lb. of mail 5,664,373 mi. The eight foreign mail contractors received $1,087,360 for carrying 325,910 lb. over 715,403 mi. The average payment was $1.05 per scheduled mile.

Boeing carried the largest volume of all. This company on its Chicago-San Francisco route received $1,632,744 for carrying 803,496 lb. of mail 1,127,724 mi., while on the Seattle-Los Angeles route it received $325,027 for carrying 114,852 lb. over 375,419 mi. National Air Transport earned $1,144,089 for carrying 907,207 lb. 1,034,032 mi., and Western Air Express got $1,005,397 for carrying 335,159 lb. over 302,417 mi.

Among the foreign carriers, Pan American Airways headed the list with a toal of $99,180 for carrying 156,404 lb. over 99,180 mi. on its Havana-Miami line. Canadian Colonial earned $44,616 and carried 63,661 lb. over 46,376 mi. On the Miami-San Juan, Porto Rico, line of Pan American, the company earned $425,688 for carrying only 9,569 lb. 213,599 mi.

A total of $6,105,247.66 was paid the domestic contractors for their operations throughout all of last year, as compared with the $6,193,083 paid during the first six months of this year. During the entire year 3,000,518 lb. of mail was carried 6,779,475 mi.

Airport Traffic Code Developed

WASHINGTON (D. C.)—A suggested traffic code for airports has been drawn up under auspices of the Aeronautics Branch in its efforts to establish uniform regulations throughout the country in matters of airport operations control. The code as finally compiled is being printed and will be ready for distribution within a few weeks. There is nothing mandatory in this code but it is hoped by the government that it will be widely adopted in the interests of orderly, efficient airport operation.

Discuss Airship Line With Eckener

Negotiations Indicate Commercial Service Next

AKRON (OHIO)—Now that the Graf Zeppelin has completed a record round-the-world flight, the next step may be the establishing of regular commercial airship service—probably in the nature of a shuttle line across the Atlantic Ocean.

This announcement was made by Dr. Hugo Eckener and Paul W. Litchfield, president of the Goodyear-Zeppelin Corporation, who, together with other airship experts, discussed airship development during Dr. Eckener's recent visit here immediately following landing of the Graf Zeppelin at Lakehurst.

No definite action that might lead to future airship lines was taken by Eckener, Litchfield, New York financial men and others who participated in the discussions. One reason was that a meeting of Goodyear-Zeppelin directors could not be held because a quorum could not be obtained.

No Definite Announcements

In an interview given jointly by Litchfield and Eckener, Litchfield said: "I have no definite statement to make. We simply have been discussing the general future of commercial lighter-than-air all over the world in all of its phases, and comparing notes in order that we may work in close harmony. We are talking with New York financial men from time to time with regard to lighter-than-air activities, but no special significance is connected with any single visit now. The Dollar Steamship Line is familiar with our plans, and has discussed them with us."

No definite time has been set for the start of commercial airship operation, Litchfield asserted. Plans are being permitted to develop naturally, and are being followed along in sequence, he said. "I think the time is coming when there will be airship lines over both the Atlantic and Pacific oceans," he continued. "It is not possible to predict which will be the first to have such a line. It takes from three to four years to build a ship after plans are formulated. It is quite probable that in operating commercial airships, Goodyear-Zeeppelin will have an interest in those companies in America, and Luftschiffbau-Zeppelin will have an interest in companies operating in other places. We cannot say at the present time what the set-up might be.

"As a result of Dr. Eckener's visit and of the conferences, Luftschiffbau-

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AIRPORT CONSTRUCTION PROJECTS

The triangular plot between runways at Port Columbus is being planted with grass for the landing of small planes. An improvement program calling for the immediate expenditure of nearly $250,000 has been approved for the Curtiss field in Denver. Plans call for a twenty-five plane hangar, administration offices, classrooms for students, shops, assembly rooms, a cafe, the levelling of the mile-square field, construction of oil-surfaced runways and installation of complete night-flying equipment.

Atlantic Airways, Ltd., has a licensed seaplane base at Millidgeville, St. John, N.B., fully equipped for repair and service. Interstate Airlines, Inc., is completing "Tennessee's Sky Harbor," a new airport near Nashville, Tenn. A third new hangar measuring 100x120 ft. was opened Sept. 1 by the Von Hoffman Aircraft School of St. Louis, Mo.

Improvement of the Curtiss Flying Service 160-acre airport a mile and a half west of Britton near Oklahoma City, Okla., was started Sept. 5. More than $200,000 will be spent on the airport including the building of a brick and tile hangar, 100 x 120 feet. Eight major runways will be provided.

Curtiss Improving Oklahoma Port

Okay Airplane Company plans to build a field at Muskogee, Okla., near its plant. Cedar Rapids, Ia., was to vote Sept. 12 on the proposed issuance of $180,000 worth of municipal airport bonds to acquire and maintain a permanent municipal airport, build three all-weather runways, extend the present lighting and drainage systems and construct an additional hangar.

The Viking Flying Boat Company, New Haven, Conn., has let the contract for construction of a hangar and runway at the municipal seaplane base of Miami, Fla. Hattiesburg, Miss., has let a contract to the Mobile Steel Company, of Mobile, Ala., for the construction of a 80x100 ft. garage at the municipal airport, Hattiesburg. The East Baton Rouge Parish, Baton Rouge, La., has voted to ¾ mill property tax for five years to raise $150,000 for an airport. The Asheville, (N. C.) Chamber of Commerce has taken a five-year lease on the T. J. Roberts Flying Field, Fletcher, N. C., to be used by the Asheville-Hendersonville line.

Shreveport to Issue Bonds

Bonds totaling $800,000 will be issued by the City of Shreveport, La., for the purchase of a large tract of land and the development and equipment of municipal airport. The government airport at Folksen, Ga., midway between Jacksonville and Waycross is to have a new hangar. Negotiations for the government to furnish complete lighting equipment of Donahoe Field in Chehalis, Wash., have been negotiated by city officials. The City Counsel of Vancouver, B. C., will purchase land on both sides of the Fraser River for new airports.

Joliet (Ill.) park board will spend $57,000 on 160-acre tract for the development of a commercial and private airport. Council Bluffs (Ia.) City Council will float a $80,000 bond issue to finance a municipal airport.

Aero Corporation of California is about to erect 20x126 ft. shop building and 26x70 ft. addition its its hangar.

A 66,000,000 cp. lighting system at Roosevelt Field, L. I., was dedicated Sept. 7. The equipment includes Sperry boundary lights, obstruction markers, flood lights, rotating beacons, searchlights, Neon fog beacon and illuminated wind cone, making this historic field well equipped for night operations. Roosevelt Field, formerly divided into Roosevelt No. 1 and No. 2 on account of the old Curtiss Field distinction, will be designated as Roosevelt Field. Since acquisition by the Aviation Corporation. A 7,900 ft. runway across the two combined fields will be utilized for heavy plane take-offs.

The American Aeronautical Corporation will lay the cornerstone for its New York Seaplane Airport at Port Washington, L. I., N. Y., on Manhasset Isle, Sept. 14. The buildings will include offices for the company, manufacturing plant, hangars and landing facilities for visiting airplanes. Ground was broken recently for the Harrisburg, Pa., Municipal Airport to cover 300 acres. A complete lighting system was recently installed at Logan Field, Baltimore (Md.) Municipal Airport.

Moline to Enlarge Port

In order to enlarge the Moline (Ill.) Municipal Airport to 330 acres the Rock Island County Court will start condemnation proceedings to secure the desired land. About $25,000 is to be spent on the development of the enlarged port. Tile runways 5,000 ft. long have been installed at the Dixon (Ill.) Airport and a beacon light is being installed. Fairfax Airport, Kansas City, Mo., recently let a contract for 100,333 sq.yd. of cut asphalt for runways. A factory building costing $130,000 will soon be erected at the same airport by the Kansas City Aircraft Company.

The Lambert-St. Louis Field is to have permanent runways installed by next spring. The Wood Brothers Corporation of Lincoln, Neb., is now constructing a 160 acre flying field at Atchison, Kan. The Brownsville (Tex.) Airport is being used by Mexican Aviation Company, the Air Transportation Company and the Texas Air Transport Company. Mexican Aviation Company has undertaken to spend $100,000 on improvements to the airport within a period of 10 yr.

The City Council of Lincoln, Neb., has let the municipal airport to a newly incorporated flying school which will construct a $30,000 brick and metal hangar on the field. The Council Bluffs (Ia.) City Council has voted for the purchase of 200 acres for an airport to cost $80,000. Royal Airways, Inc., will construct an airport with complete flying accommodations at the Pennco Airport, Madison, Wis. M. C. Connor of DePere, Wis., is building an airport south of the city.

The airport at West Bend, Wis., is now under construction and will be dedicated in the near future. The Menominee (Wis.) Airport Company, will soon erect a hangar and purchase a cabin plane. The County Park Commission of Milwaukee, Wis., will spend $20,000 on a new hangar at the County Airport. The Sheboygan (Wis.) Airways Company is building a new hangar to accommodate ten planes.

Removal of the high tension wires around the Los Angeles (Calif.) Municipal Airport, which proved a hazard for the take-off of the Graf Zeppelin, is being negotiated by the City Council. Hangar No. 5 at Oakland (Calif.) Airport, to be occupied by Boeing Air Transport and Boeing Flying School, will be completed Sept. 15. The Detroit Aircraft Corporation has purchased a 30-acre tract at Long Beach, Calif., for the erection of a plane factory. A county public airport near El Monte, Calif., covering 900 acres has been proposed by the Regional Planning Commission.

Add to Mills Field Hangars

The Municipal Airport of San Francisco, Calif., is preparing plans for additions to existing hangars No. 2, 3 and 4 at Mills Field. Two hangars and an administration building are to be built at once at the Swan Island Airport, Portland, Ore., at an estimated cost of $75,000. The Tillamook (Ore.) Airport was recently opened by H. S. Wilson, C. A. Anderson and B. Hathaway. Klamath Falls, Ore., recently voted $50,000 in bonds for the construction of a modern airport.

Lawton, Okla., has let the contract for construction of 80x125 ft. hangar, costing $11,465. Williston (S. D.) Chamber of Commerce is building an addition to the local hangar. Chamber of Commerce, Mankato, Minn., soon will let contract for erection of 60x80 ft. hangar.

Airport Dedications

The Kenton (Ohio) Airport was dedicated Aug. 4. Fresno (Calif.) Municipal Airport, Chandler Field, was opened for commercial use Sept. 1. A three-day air circus was held in connection with the dedication of the Alexandria, Ind., Airport Sept. 1. The Logan-Cache, Utah, Airport was opened Sept. 2. The $25,000 Newark (N. Y.) Airport was opened Sept. 2. This field is planned as an emergency landing on the Albany-Cleveland air mail line.

The Big Springs, Tex., Airport costing $100,000 which was formally opened Sept. 11-12 has been leased to Southern Air Transport, Inc. The Pittsburgh-Greensburg, Pa., Airport will be dedicated Sept. 20-21. The Durango (Colo.) Airport will be dedicated Sept. 28-29. The Dublin (Ga.) Airport will be ready for flying operations in October. Tennessee Sky Harbor near Nashville will have accommodations for air travelers by Oct. 1.

Discuss Airship Plans With Dr. Eckener

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Zeppelin and Goodyear-Zeppelin Corporation will work together more closely in furthering lighter-than-air transportation. We have been discussing all of the plans and are trying to sift out the most feasible."

Both Litchfield and Eckener agreed that the round-the-world flight of the Graf Zeppelin had done much to hasten the day when regular airship service will be established.

"We have shown what a Zeppelin airship can do," Dr. Eckener said. "Now we will try to establish regular shuttle service over the Atlantic. We are not going to make another world flight, for there would be no advantage in beating our own record. The next thing is to prove that Zeppelins can be operated over regular commercial lines."

Akron Plant Lauded

Dr. Eckener was enthusiastic in his praise of the Akron municipal airport development, especially the airship factory and dock that Goodyear-Zeppelin Corporation is building there.

"I am very well satisfied with developments at Akron," he declared. "I have never seen such a fine hangar for airships anywhere in the world."

The Zeppelin skipper made this declaration after inspecting the airport development, both from the air and on the ground.

He told of the new airship that the Luftschiffbau-Zeppelin is building at Friedrichshafen. It is to be about 30 per cent larger than the Graf Zeppelin, having a gas capacity of about 5,000,000 cu.ft. It will be no longer, but will have a greater diameter—a feature that was proved necessary by the world flight of the Graf Zeppelin.

Plan Greater Speed

"The new ship will have more speed," Dr. Eckener said. "The Graf is too slow, we found. The new Zeppelin will be powered with eight motors instead of five. These will be placed outside the envelope because we have no helium gas in Germany, and hydrogen must be used. Nothing out of the ordinary is being planned for this ship. It will be completed the spring of 1931."

The Graf Zeppelin's future activities are problematical, Dr. Eckener said. It may make another trip to America this fall, and is to tour parts of northern Europe within the next few weeks. He indicated the need for a large hangar on the Atlantic seaboard by pointing out that he could not impose upon the Navy too much for use of its Lakehurst station.

Air Mail Reply Cards Popular

WASHINGTON (D.C.)—The experimental use of business reply cards by air mail, recently authorized by the Postmaster General, has already proved popular with many concerns.

Progress Offered Prize For Airport

ST. PAUL (MINN.) — Endeavoring to stir up interest in Minnesota, Col. L. H. Brittin, vice president and general manager of Northwest Airways, Inc., has announced that he will donate a trophy, to be awarded to the community showing the most progress in airport construction within the next year. The trophy will be awarded in September, 1930.

Elements to be considered in awarding the trophy include: airport adequacy, planes operating, hangars, communication facilities, weather information, gasoline and oil supplies, organizations to promote aviation and town marking.

Kohler Opens Lake Line

MILWAUKEE (WIS.)—Kohler Aviation Company, Chicago, opened a cross lake service from Milwaukee to Grand Rapids on Sept. 1.

Canada Arranges Arctic Mail Route

OTTAWA (ONT.)—Plans have been completed for the establishment of the Arctic air mail service which will go into operation early in November, it was announced recently by the Canadian postmaster general. The service will start from Fort McMurray, Alta., and terminate at Aklavik, N. W. T., near the mouth of the MacKenzie River.

This route, which will extend almost parallel to the historic fur-trader's trail for nearly 2,000 mi. north and northeast along the Athabaska, Slave and MacKenzie Rivers, penetrates farther north than any other air mail service in the world, and will bring a remote but important region of Canada's vast northland close to the main arteries of traffic. Previously it has been necessary to rely on dog teams for the transportation of mail in the winter and the advent of the plane will reduce days to hours. Fourteen points of call will be on the route.

Starts Service in Yukon

NOME (ALASKA) — With the Yukon territory as its field, Yukon Airways and Exploration Company, Ltd., has begun operations with a Ryan Brougham piloted by J. M. Patterson. The company was formed recently, with W. A. Puckett, as president, to provide mail passenger and light freight transportation facilities between White Horse, Mackenzie and Telegraph Creek points.

Plan New Line To Span Continent

MILWAUKEE (WIS.)—The proposed new transcontinental air line with Milwaukee as the operations base and with Halifax, Nova Scotia, as the eastern terminal and Vancouver, B. C. as the western, is not expected to be in operation until around the first of the year.

The new line was announced here ten days ago when Col. L. H. Brittin, St. Paul, vice-president and general manager of the Northwest Airways, conferred in Milwaukee with Carl Herzfeld, chairman of the Association of Commerce air service committee. The line will be operated by Northwest in conjunction with the Western Canada Airways. Northwest now operates the Twin Cities-Milwaukee-Chicago, Twin Cities-Chicago and the Fox River Valley lines.

To Span Lake Michigan

A new line will be projected by Northwest across Lake Michigan from Milwaukee to Detroit using amphibions, probably Sikorsky machines. Northwest will also extend its line westward from the Twin Cities to Winnipeg, Canada, via Fargo, N. D. Transfer to Western Canada planes will be made at Detroit for Halifax and at Winnipeg for Vancouver. Ford planes will be put in service between Milwaukee and the Twin Cities. The new cross lake line will not interfere with establishment of the Milwaukee-Grand Rapids line, which will begin within ten days, it was said.

Frank B. Kellogg, former United States secretary of state, has been engaged by Northwest as counsel to handle the interests of the new arrangement, because of the international character of the business, according to Mr. Brittin.

Buenos Aires-Santiago Line Operated by U. S. Firm

NEW YORK (N. Y.)—Regular passenger service across the Andes Mountains is being operated on a weekly basis between Santiago, Chile, and Buenos Aires, Argentina, by American International Airways, associated with N. Y., Rio & Buenos Aires Lines, Inc., of this city. A fleet of Ford tri-engined planes and a 20-passenger Sikorsky biplane make the 800 mi. trip in 10½ hr., as against 36 hr. required by the Trans-Andes Railroad. The planes, carrying passengers, mail and express, make stops at Rosario, Cordoba and Mendoza, climbing to 18,000 ft. in going over the 14,000 ft. mountain pass near Mendoza.

The Buenos Aires-Montevideo division of the same system has been operating two round trips daily over the 125 mi. water route which steamers make in an overnight trip. This line has proved so popular among vacationists to the summer colony at Montevideo that the air fare is only $3.50 more than the boat fare.

FOREIGN ACTIVITIES

Operations Reported On Mexican Airways

MEXICO CITY (MEXICO)—During the first seven months of the present year planes on the mail and passenger airways of Mexico flew a total of 989,366 km. (618,357¼ mi.), carried 5,539 passengers and 106,317.8 lb. of correspondence on the 5,772 flights, according to figures compiled and officially announced by the department of aviation of the Ministry of Communications and Public Works. The Mexican Aviation Company heads the list with 3,563 passengers and105,572.94 lb. of mail carried during this time. The newly established routes of the Aeronautical Transport Corporation between Matamoros on the Gulf of Mexico and Mazatlan on the Pacific seaboard made 147 flights, using five planes and carried 111 passengers and 744.9 lb. of mail.

Mexican Aviation Company planes flew 467,875 mi. and made 2,380 flights, using 29 planes, 23 pilots and nine co-pilots. Fourteen planes and twelve pilots were used by other commercial aviation enterprises from January to July. These planes made 3,245 trips and carried 1,865 passengers.

Figures just announced by the department show that there was a record movement of commercial planes at Valbuena Flying Field here during the week August 18-24. The movement covers both the departure and arrival of planes and practice flights. Fifty-three trips were made during the week, 36,176 km. (22,610 mi.) flown, 150 passengers carried and 2,269.5 lb. of mail transported. Fourteen trips were made over the Mexico City-Brownsville route and 6,379.8 mi. flown. Eight trips were made on the Mexico City-Guatemala line, the planes in this service covering 5,570 mi. During the five trips made on the Mexico City-Ciudad Juarez route the planes flew 4,994.1 mi. Nine practice flights were made. This was the heaviest week the Mexico City airport has ever had.

Preparing For Distance Attempt

CRANWELL (ENGLAND) — Another attempt to break the distance record is to be made soon under auspices of the Royal Air Force. This time the same Fairey long-range monoplane, which recently was flown from here to Karachi, India, on a similar attempt, will be used again. On the last flight the machine was flown 4,130 mi. The record is 4,453 mi., established by Ferrarin and Del Prete on their flight from Italy to South America. Squadron-Leader A. G. Jones-Williams and Flight Lieutenant N. H. Jenkins, again will be the crew.

Will Attempt Altitude Record

BRUSSELS (BELGIUM) — With the primary intention of studying rays of short wave-length, Professor Siccard, of the University of Brussels, will attempt to reach an altitude of more than 50,000 ft. in a specially constructed balloon. The National Foundation for Scientific Research has furnished him with a fund of about $15,640 to enable him to carry out the experiment. The detailed plans of the balloon have not been given out, but it is said that instead of a basket it will have a closed cabin built integrally with the envelope.

Morzik Wins Light Plane Tour of Europe

PARIS (FRANCE)—Final tabulation of all the factors in the International Light Plane Tour, August 3-14, gives first place to Fritz Morzik, of Germany, flying a B.F.W. M-23 low wing two place monoplane powered with a 70 hp. Siemens Sh. 13 engine. He accumulated a total of 138.5 points. Capt. Hubert Broad, flying a Gypsy-Moth Coupe, was second, with 135.25 points, although he made the fastest time around the course.

Lord Carberry was third, with a total of 131 points. He flew a Raab-Katzenstein low wing monoplane powered with a 100 hp. Cirrus Hermes engine. Other place winners and their planes were: Fourth, Herr Lusser, of Germany, Klemm L-25 (40 hp. Salmson), 128.5 points; fifth, Pilot Guazetti, of Italy, flying a Romeo Ro. 5 (85 hp. Fiat engine), 127.25 points; sixth, Pilot Von Dungern, Germany, flying a plane similar to that of Morzik, 126.75 points. [Other details of the event are printed elsewhere in this issue and in the issue of August 17 and 24.—Ed.]

English Guggenheim Entry Performs Well

LONDON (ENGLAND)—The new British plane, which has been entered for the Daniel Guggenheim Safe Aircraft Competition, will leave soon for America, and those who have seen it fly say that it has remarkable properties of slow flight at amazing angles to the ground.

It has been designed by Handley Page, Ltd., and full advantage has been taken of the Handley Page automatic slot, the use of which retains lateral control of an airplane when its speed has become so low that otherwise it would stall and spin into the ground. Its wings are more than usually well provided with slots, and, in addition, there are flaps along the trailing edge which also greatly add to its capacity for slow flight under perfect control. The machine has been photographed leaving the ground at an angle of at least 45 deg. Such an angle is impossible for a normal machine, and the fact that it could fly off the ground in such a position with perfect control indicates that a pilot when landing should be able to do so at such a slow speed that the machine can be regarded as almost foolproof.

In appearance the airplane is of quite a normal type, and high hopes are entertained of its success in this international competition for a first prize of $100,000. Maj. R. H. Mayo, British representative of the Daniel Guggenheim Fund for the Promotion of Aeronautics, considers the conditions so difficult that he doubts if any aircraft, except one using the Handley Page slots, or designed on the principle of the Cierva Autogiro, which is also to be represented, can fulfill all the requirements.

The Handley Page Guggenheim entry in trial tests in England

Foreign News Briefs

The government of Ecuador is planning to build a modern airport at Quito, the capital city.

Air express in Mexico has cut considerably into the express shipment by rail.

A glider has been built at the School of Navigation and Civil Aviation at Vera Cruz, Mexico, according to plans furnished by the Mexican Association of Aeronautics and the National Glider Association, of the United States.

Plans are being completed by the Mexican Department of Aeronautics of the Ministry of War and Marine for a flight from Los Angeles, Calif., to the Mexican capital by Col. Pilot Pablo L. Sidar, one of the leading pilots of the Mexican army air service. He will use a Douglas fitted with a Hornet.

Mexico is making extensive preparations for the reception of about 150 persons expected to visit that country in about 50 commercial planes during the latter half of September. The planes will make a limited tour of prominent cities.

Guaymas, Sonora, Mexico, one of the principal seaports in northwest Mexico, is planning to build an airport, which will be used by planes on the Tijuana-Mexico City line.

Mexican and foreign models of aircraft and accessories will be on display at an air show at Mexico City in connection with Aviation Week, which is to be held November 12-19, under the auspices of the Mexican Association of Aeronautics.

Major Maddalena of Italy has announced plans to fly in November from Rome to New York, non-stop.

Under the auspices of the Aero Club of France there will be held at La Baule, France, on September 14 and 15, an international meeting for flying boats and seaplanes and a contest for the Aero Club of France Cup. [This will be described in a later issue.—Ed.]

Ahrenberg Quits Flight to N. Y.

IVIGTUT (GREENLAND)—Capt. Albin Ahrenberg and Lieutenant Floden, defeated by bad weather and engine trouble in their attempt to fly by stages from Stockholm to New York via Iceland and Greenland and Labrador, have abandoned the undertaking and have returned to Copenhagen by steamer. It is understood that they now consider impracticable the northern route between Europe and North America, the theoretical value of which they had intended to prove.

Mexico to Try Gliders

MEXICO CITY (MEXICO)—The sport of flying in planes without engines is soon to be introduced in Mexico. Plans for such planes have been received by the Mexican Aeronautical Association from the National Glider Association of the United States in response to a request from the Mexican organization.

Mexican Airline Expanding

MEXICO CITY (MEXICO) — Corporacion Aeronáutica de Transportes (Aeronautical Transport Corporation) is the name of the concern which Theodore T. Hull, of Los Angeles, recently opened in this country. [See page 496, issue of August 31.—ED.] Besides operating from here to Ciudad Juarez, opposite El Paso, Tex., with stops at San Luis Potosi, Zacatecas, Torreon, Jimenez and Chihuahua, the company also is operating a spur line from Chihuahua to Nogales, Sonora, and a line between Matamoros and Mazatlan by way of Monterrey, Torreon and Durango. In addition to these lines one is to be opened between Monterrey and Tampico in the near future, the company reports.

Build Caproni 97 C For Airline Operation

MILAN (ITALY)—Featuring a structural framework of high tensile strength steel tubing, fastened by a special method which is claimed to be superior to welding, the Caproni 97 C six-passenger cabin monoplane has been produced for airline operation. It has already been used extensively on Italian airlines, notably the Rome-Milan-Trento-Monaco line which crosses the Alps, which offers a severe test of performance.

The plane is powered with one 420 hp. Jupiter engine. The Caproni model 97 Tr. C is similar in all respects except that it is arranged for three engines of 100 to 120 hp. each, and is especially recommended for mountain flying, as it can fly with two engines only.

The unusually wide undercarriage is mounted upon an ingenious system of cross members which also serves to brace the wing engines in the three-engined model. The wheels are provided with brakes, a comparatively new feature in European design.

Dimensions and performance figures given by the company for the single-engined plane are as follows:

Span	52 ft. 6 in.
Length	36 ft. 7½ in.
Height	11 ft. 6 in.
Total lifting surface	430½ sq.ft.
Weight empty	3,086 lb.
Pay Load	2,204.6 lb.
Maximum speed, about	133 m.p.h.
Stalling speed, about	56 m.p.h.
Service ceiling, about	16,400 ft.

P.A.A. Radio System Reported Satisfactory

MEXICO CITY (MEXICO)—Complete satisfaction is being given, it is announced, by radio communications between planes and land stations and between the intermediate land stations in the system recently put into effect by Pan-American Airways, and its subsidiary, Mexican Aviation Company. The various ground stations keep in close touch with planes in flight and the weather conditions under which they are traveling, and the pilots are immediately informed as to weather they will encounter over other sections of the routes.

The Mexican Aviation Company recently established a 200-watt ground station on the Island of Cozumel, off the coast of Yucatan, and connecting the Central and South American branches of the Pan-American system with Mexico. The station has a radius of 1,000 mi. and sends weather reports to the Tampico station every half hour.

The company is making arrangements to build a high-powered ground station on the Sierra Madre mountain range which is the barrier between Mexico City and Tampico. This station will be limited to weather reports and will make a detail study of wind currents, fogs and clouds over the mountain region which is in the path of the company's mail and passenger service between the Mexican capital and the oil port. It is expected that this station will be in service soon.

Form Air Tourist Commission

MEXICO CITY (MEXICO) — Representatives of various aviation companies operating the air mail and passenger lines in Mexico and connecting this country by air with the United States, have been named members of the National Mixed Commission for Tourist Traffic. These executives will compose a subcommittee of the commission. Those appointed are: Lee C. Balch, of Pickwick Airways and Latin-American Air Transport Company; Abel Espinosa, of the Aeronautical Transport Corporation; Rodolfo Becerra Soto, of the Mexican Aviation Company and Ernesto D. Jimenez, of the Inter-Americas Air Transport Company.

The Caproni 97 C Fitted With Single Engine

WHAT OUR *Readers Say*

Problems of the Inventors

To THE EDITOR:

We read and hear so much of the great future in aviation, and by reading the magazine articles one is inclined to believe that we now have the ultimate airplane.

For whom is this great future? If we now have the ultimate airplane, then I would say that the great future is especially for the producers and salesmen and their agencies who can sell the present airplanes to the public.

If we have not the ultimate airplane then the great future must be for the inventor, who is generally a super-mechanic without financial means to materialize his mechanical ideas, and unless he becomes a super-salesman he must wait until competition and capital realize and demand his brain products.

Just now there seems to be no great demand in evidence for this sort of product.

The only protection and assistance an inventor gets today is through the patent office, and even then he has to become the proverbial salesman in order to do business with capital.

It seems to me that there should be some bureau or "society of investigation of feasible inventions" established that could create a more favorable relationship between capital and invention, especially in the aeronautical field wherein it costs so much to experiment.

If, to your knowledge there is such a society in existance that gives reasonable reports on aeronautical inventions that have been patented it would please me to know of it.

FRANK E. SKROBACK,
Syracuse, N. Y.

[The place of such a society as Mr. Skroback seeks is at present filled by the Patents and Design Board, composed of the three assistant secretaries for aeronautics and having the right to purchase for the government any inventions or designs for a sum not to exceed $75,000. All inventions subjected to the Board are first referred to the National Advisory Committee for Aeronautics for approval, which must be given before the Board can act favorably.—ED.]

• • •

Lumber-Built Hangars

To THE EDITOR:

I am writing in reference to the article entitled "Lumber-Built Airplane Hangars" in your July 20 issue.

"Nearly two-thirds of all hangars in this country are either roofed or entirely built of lumber," says Mr. Perkins. Fifty years ago that was probably true of *all* buildings—before a *better* material was found.

Flying jumped into popularity over night—immediate shelters were needed—such demand was not anticipated by steel building fabricators—the line of least resistance was taken—wood hangars *were* built! Will that always be true? Ten years ago practically the entire rigging, spars, struts, fuselage, etc., of all planes was of wood. Is that true now? Why?

Less than five years ago the outer covering of *all* airplanes was cloth. Is that true now? Why?

"Most types of hangars can be heated fairly well, the exception being the sheet metal siding construction, which, however, is little used in northern climates," says Mr. Perkins.

We live, move, and have our being in Wisconsin—a northern climate—and have been for fifteen years successfully and satisfactorily heating our steel buildings. Heating engineers grant our insulated sheet steel building heating properties equivalent to an 8" *solid* brick wall. We have *homes* built of steel.

Ask Mr. Perkins what the heating properties might be in a single wall wood hangar.

Sure—a wood hangar can be erected for $12,000.00, but a steel hangar of identical dimensions will *not* cost even half of $40,000.00.

How much of Mr. Perkins' wood hangar is completely portable and salvageable in case of moving it to another location should the necessity arise?

Ask Mr. Perkins what the insurance rate is on the average wood hangar on any airport, and what company will carry it.

By golly! I started out to write a little note and now it is nearly a book. There is plenty more that could be said.

M. S. LOCKE,
Esline Company,
Oconomowoc, Wis.

[In addition to the above letter of direct comment on some of the points made in Mr. Perkins' article, Mr. Locke has written a paper of his own on steel hangars, which will appear in an early issue.—ED.]

Editorial Comment FROM THE DAILY PRESS

Circumnavigated By Air

THE SMALL BOY, watcher of the skies at Lakehurst yesterday morning, who first saw the Graf Zeppelin loom through the mist will always remember his thrill. The early rising thousands of New York City who watched the airship circle the town on its way to the end of its epochal journey could not wait to inform the sluggard that they had been present on the great occasion. The millions outside the Zeppelin's orbit who did not actually see the finish of the spectacular flight heard by radio, newspaper and telephone that the task was done. Not in years has public interest been so warmly captured by an event. It is something to have lived in the day when the world was first circumnavigated by air; when the Pacific was crossed in a non-stop passage from the Orient, and when the same set of passengers, luxuriously housed, saw the whole earth unroll like a scroll beneath them.

From the standpoint of the pilot, and of the experts who constructed the airship, this flight is but an "experiment." Ships like the Graf Zeppelin must be much larger, they insist. Provision must be made against storms and the ever-feared menace of lightning. Better time must be made, although to girdle the earth in actual flying time of 11 days, 23 hours and 33 minutes suggests the magic carpet of Eastern tale. Yet it is this very unwillingness of science to be content with achievement that has sent civilization so swiftly on the path of progress.

Among those who now concede that the dirigible airship is the best means yet perfected for transoceanic travel are the airplane pilots, Colonel Lindbergh among them. They could not, as aviators and sportsmen, have withheld such an admission from Eckener after his notable flight. Through fogs and around storms he safely guided his great craft, and the "Gott sei dank" which he is said to have uttered at Lakehurst when the Zeppelin settled down could not be construed as in any sense implying doubt his ship could come through safely. In the same spirit Morse said, "What hath God wrought!"

NEW YORK TIMES.

THE BUYER'S LOG BOOK

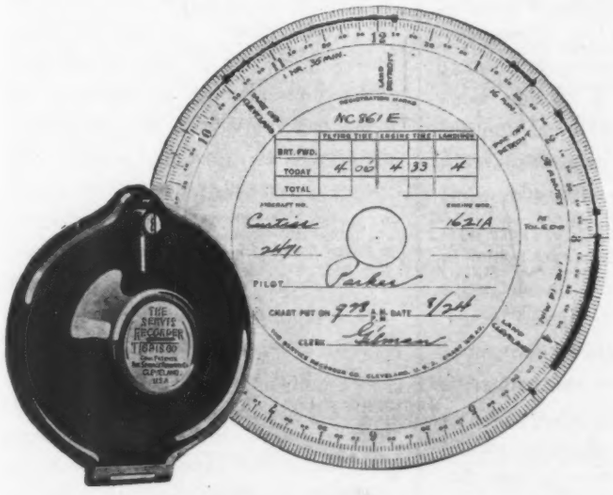
"Servis Recorder"

THE Service Recorder Company of Cleveland, O., has recently introduced an instrument which automatically records every activity of both plane and engine.

This instrument, known as the "Servis Recorder," is a small and very simple precision device which automatically writes a complete log of the plane. It is a completely self-contained unit operated by its own clock mechanism. A stylus which responds to the side-sway and vibration of the plane "writes" the record. The Servis Recorder may be attached in a short time to any part of the cockpit or cabin. It is an independent unit and is not connected with the motor or other mechanism in any way.

Each day a fresh chart is inserted and the clock rewound. No ink is required. As the chart revolves within the instrument a sapphire stylus acts on an opaque wax coating, revealing the dark paper beneath. At the end of the day a complete, accurate, and inviolate record of every movement of the plane appears on the chart. This record is invaluable to plane operators and their operating and accounting departments. The six-inch chart makes a convenient and permanent operation record, giving a day by day log of both motor and ship.

An example of how this log is written is furnished by a glance at the accompanying reproduction. The continuous narrow line indicates time elapsed while the chart was in the instrument. Wider lines tell the history of the day. Each operation has its distinctive



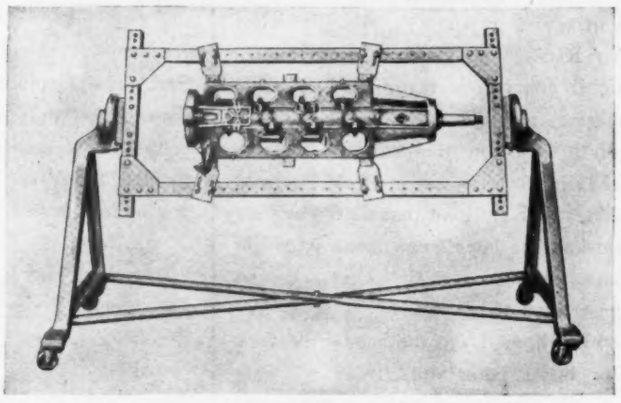
A photograph showing the "Servis Recorder" and the type of record made by the instrument

symbol. The application of the Servis Recorder to aviation has been brought about by the demand of commercial aircraft operators in this and foreign lands. Long experience has shown its value. The practicability of the Servis Recorder seems to be indicated by the fact that many are already in daily use on motor trucks and buses.

Lipe Engine Stand

IN ORDER to speed up the work of overhauling airplane engines, the Lipe airplane engine stand was developed. This stand is manufactured by W. C. Lipe, Inc., Syracuse, N. Y., and distributed by the General Aviation Co., Inc., of that city.

This stand is mounted on diagonal leg braces providing unobstructed standing room. Double swivel casters



The Lipe airplane engine stand with a "V" type engine mounted for overhaul

with ball bearings are used so that the unit can be moved from place to place.

The frame is easily adjustable for width and length. It can be revolved freely in a complete circle in either direction and can be locked in any desired position by a hand clamp. All sizes and types of engines can be mounted on the stand.

Standard equipment includes one rotating adapter ring for any specified type of radial engine. This rotating ring is a convenience as it permits revolution of the motor on two axes. In addition, brackets are provided for in-line and "V" type engines. These brackets are slotted to permit accurate adjustments at any angle. Additional adapter rings for other radial engines also can be supplied.

Champion Aero A Spark Plug

ANNOUNCEMENT has been made by the Champion Spark Plug Company, Toledo, Ohio of the development of a new aviation spark plug. This plug, which is designated Champion Aero A, is the result of a long series of experiments.

The restricted bore of the Champion Aero A spark plug makes possible an extra exposure of the center electrode and the use of a short projection of the primary insulator without in any way impairing the ability of the plug to withstand heat and oil. It is stated by the manufacturer that because of this restricted bore, breakage cannot occur in such a manner as to interfere with engine operation.

SIDE SLIPS

By
Robert R. Osborn

Annual Report of Side Slip's Special Correspondent at the National Air Races

(With apologies to Mr. Ring Lardner)

DEAR EDITOR:—I know you and the Gen. Public has been anxiously waiting my reports vs. the Cleveland Air Races, on account you not knowing if you are in favor of them until hearing from me. Well, Ed. I couldent get to the show this year on account I having to see a lad in Phila. regards a dog, an I am glad that Cliff Henderson and the boys went ahead with the show anyway, as the Com. People must have there fun, say I. Visiters coming home from there tells me they was bitter complaints from my vast no. of admires what had gathered when the management had to admit I wouldn't be there, and tried to run in Lindbergh, Doolittle, Williams an others to divert there attention from this shortcoming. Well, Ed. I am sorry but a fellow can't be all over the maps, except possibly Mussolini, an some things has to be run by my assistants as best they can.

I see by the papers they was crowds of 100,000 in the stands each day, well Ed. a newspaper reporter once tells me his paper always had 10,000 people in line in all parades, an one day sends a lad out to count a parade an discovers they was 2,200 people in it which was a large one. Well, I am glad the newspapers has set on 100 grand as the standard for air races as it means they is probably 20,000 people interested in air races an a city can maybe run one in the future without mortgaging the city hall an cutting down on the politicians graft.

The papers also seems to be making a lot of fusses over the facts concerns the Navy ships which put on a show for the crowd was tied together with ropes an ribbons, an I beg to state that lots of the boys has been flying crates for yrs. which was tied together not only with ropes, but bailing wire, friction tape, telephone wire an clothes line. The Dept. of Com has condem these ships only on this acct. an it is time they was more appropriations for the Army an Navy so they could get better ships. But mind you none of the boys has ever used ribbon no matter how bad his ship was crashed. He would say, "Ribbon, what and the H--- do you think this is, a gals boarding school. Give me that there flour sack an hand me that can of dope." Aviation has come to a pretty pass, say I, when the boys starts using ribbon, an maybe they would like some lace on there ailerons, what?

I understands from the newspaper boys what was in on the know, that as a results of this years races, next yrs. events will incl. a outside looping contest for gliders an a stunting contest for tri-motor transports. My suggestions would be also add a refueling endurance record for ships in inverted flight and regards some of the recent designs in racing ships which has just about eliminated wings, suggest that all airplanes be required to have wings just for the principals of the thing. Its OK to try to go fast an all that but all ships should have wings even if they is only fins cast in the motor case. We must keep some of our principals for the childrens sake.

Also read of a good idea vs. next yrs. races from the Schneider Races this year, all ships having navigability tests, in which they moors the ships out over night in the water an then holds the race with the ones found above the high tide mark next morning an which can be bailed out in time. Well Ed. what I am getting at is a joke an I mean the pilots should be give a navigability test at these Nat'l Air Races on account the oil furnished by the oil companies. As some of your readers may be of the nay mind, I will exclaim what I mean. After attending one of the parties throwed by a oil co. I think a pilot should be able to make a couple of good landings, say in the hotel lobby, an then be moored out all night behind a palm, also potted, without being bailed out in the A.M. This will avert the present difficulties the next morning when many of the boys mistakes the fifty mile free-for-all race for the smoke screen demonstration thereby getting the timers more confused than ever.

An I beg to state that when a timer is confused more than usual it is serious, no end, what with him having to wave to all his friends, and go down for fresh supplies of pop, open peanuts fast enough to keep hisself supplied from starving, an look over the latest papers regards the possibilities the Athletics or Cubs winning the series. I remember one yr. the timers was so disturbed by their favorite getting beat in a boxing match over the radio they announced a top speed of 180.496 miles per hr. for the balloon busting contest.

Well Ed. I am sorry the Races this year should fall so short their usual high standard on account my absents this year, but I expect to have th dog situation in Phila. well in hand by next year an they should be no hitch then. Meanwhiles, I think Cliff Henderson and the large committee which took my place should be congratulated for doing so well as they did considering the handicaps of my absents.

Yrs. V'y Tr'ly,
THE INTREPID AVIATOR.

With J-6 5-cylinder Wright "Whirlwind" motor, Bendix brakes, navigating equipment and customer's choice of colors, the WACO "165" is priced at only $6370, flyaway WACO Field . . . convenient terms, if you desire.
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FOR passenger hops and other commercial flying, you will find that the WACO "165" is in a class by itself.

Above all things else, for such service you want a ship that is absolutely dependable and has *extra* ruggedness—especially in its underpinning. The "165" was designed with that in mind. It is one tough ship, built for knock-about service . . . stronger than necessary . . . in every detail. It will take an incredible amount of abuse.

And it is *practical.* It carries a disposable load of 1070 lbs. on ten gallons of gas per hour at 105 m.p.h. cruising speed. It has flying qualities typically WACO . . . flies hands-off almost indefinitely . . . yet shows not the slightest tendency to sluggishness on the controls. And, like every WACO, it asks no favors of a landing field. You can sit down anywhere with it . . . and hop out again just as easily.

We'd like you to know more about the WACO "165" and its many exceptional features. Send for the new book that gives full details and specifications. Write for your free copy . . . today.

THE WACO AIRCRAFT COMPANY
Troy, Ohio

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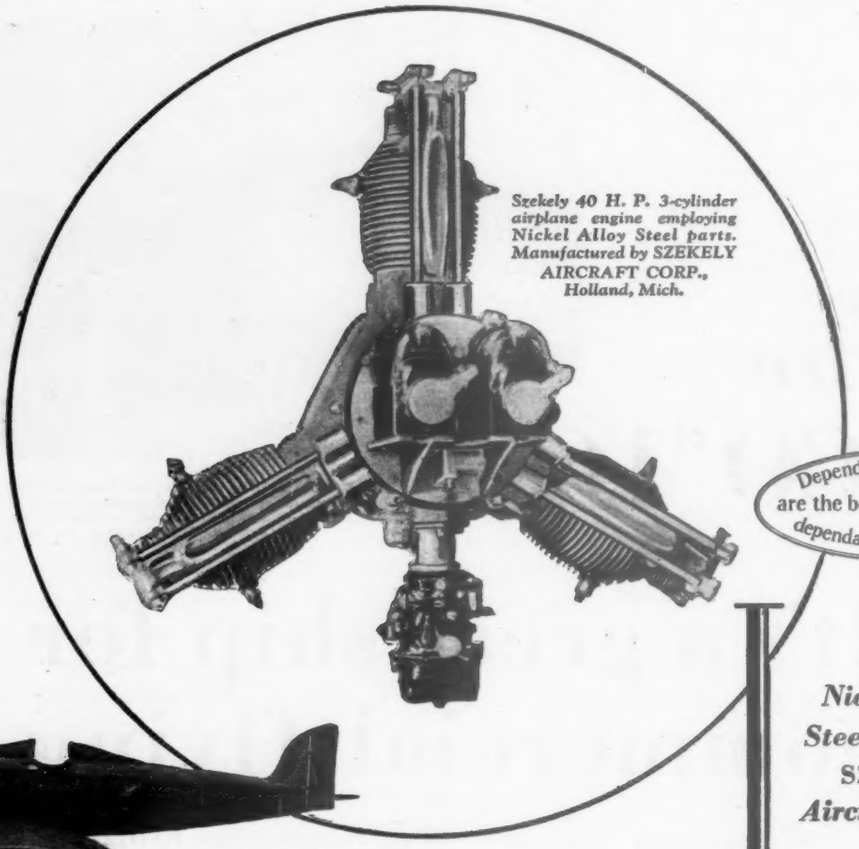
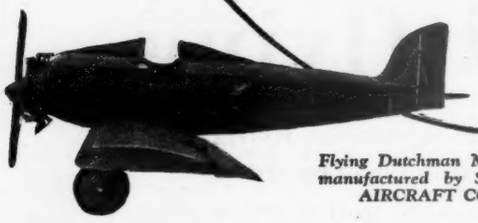
"ASK ANY PILOT"



Szekely 40 H. P. 3-cylinder airplane engine employing Nickel Alloy Steel parts. Manufactured by SZEKELY AIRCRAFT CORP., Holland, Mich.

Dependable materials are the best assurance of dependable performance



Flying Dutchman Monoplane manufactured by SZEKELY AIRCRAFT CORP.

SZEKELY...*another* aircraft engine using dependable *Nickel Alloy Steel* parts

Nickel Alloy Steel parts in* SZEKELY *Aircraft Engine

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Crankshaft	3140
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SZEKELY radial aircooled aircraft engines have been designed to meet the increasing demand for a reliable, compact power unit for small planes. In these engines where it is particularly important that all excess weight be kept down to a minimum, dependability is insured through the use of Nickel Alloy Steel parts.

Additional important uses for Nickel Alloy Steel are found in the Flying Dutchman, a low wing monoplane produced by Szekely and powered by one of their SR-3 engines. Fittings on the Flying Dutchman are held in place by groups of Nickel Chromium Steel bolts extending entirely through the spar, thus insuring a solid footing for the absorption of strains. Also, four Nickel Alloy Steel bolts in double shear are used for the attachment of the engine to the fuselage.

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July 5, 1929

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The instrument board which you provided for me on my flight which was the first solo round-trip from New York to Los Angeles and return, establishing records, proves conclusively the value of your efforts.

This instrument panel materially aided me in both the navigation of the plane and the recording of the motor's functions. I am very proud of this installation of Pioneer Instruments and feel a great sense of satisfaction by flying over the country with their use.

The service as rendered by both your Eastern and Western Representatives was splendid. Their cooperation and workmanship was without fault and decidedly places not only the men themselves in my high esteem, but also the Company they represent.

Sincerely yours,

Frank M. Hawks

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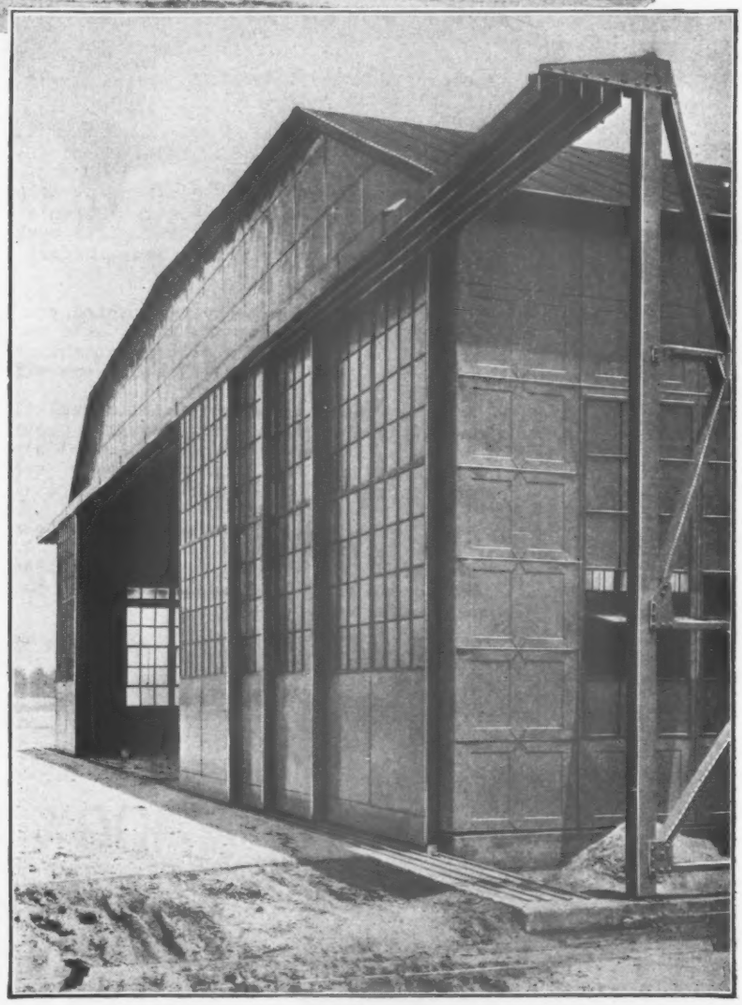

Standard Oil Company Hangar, Municipal Airport, Memphis, Tennessee. Truscon All Steel Hangar with Airplane Hangar Doors

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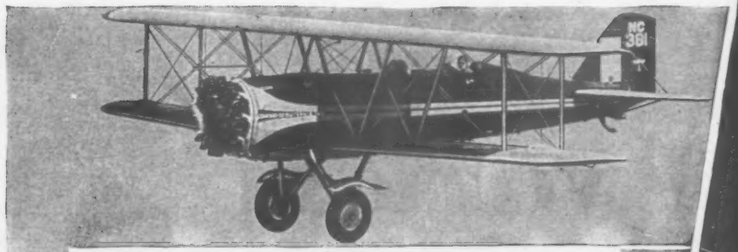
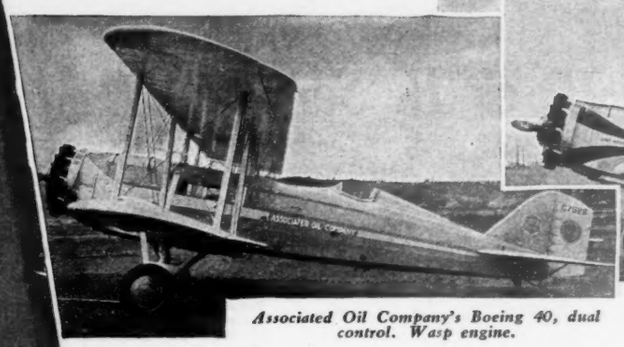
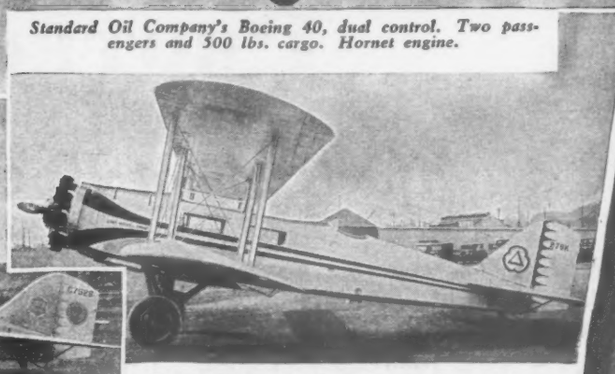
OIL companies choose BOEING planes



Standard Oil Company's Boeing 40, dual control. Two passengers and 500 lbs. cargo. Hornet engine.



Associated Oil Company's Boeing 40, dual control. Wasp engine.



Empire Oil Company's Boeing 40. Four passengers and 500 lbs. cargo. Hornet engine.

LARGE corporations buy airplanes on proven efficiency and guaranteed, not estimated, performance. They, like the five large air mail companies which use Boeing equipment to move half the nation's air mail, want "seven-day-a-week planes."

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Division of United Aircraft and Transport Corporation

Boeing Offers the Following Models for Early Delivery

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Write for catalog on various models.

	"40-B4" Mail, cargo, 4-pass. and pilot, cabin biplane	"40-B2" Mail, cargo, 2-pass. and pilot, cabin biplane	"95" High speed, large capacity, mail, cargo, biplane	"100" High speed, single seater land sport biplane	"204" Four pass. and pilot, cabin flying boat
Empty	3722 lbs.	3543 lbs.	3196 lbs.	1871 lbs.	3358 lbs.
Pay load	1253 lbs.	1436 lbs.	1600 lbs.	23 lbs.	913 lbs.
Useful load	2353 lbs.	2536 lbs.	2644 lbs.	829 lbs.	1642 lbs.
High speed	132 mph	132 mph	142 mph	165 mph	115 mph
Cruising speed	105 mph	105 mph	125 mph	140 mph	90 mph
Landing speed	57 mph	57 mph	56 mph	56 mph	59 mph
Engine	Hornet	Hornet	Hornet	Wasp	Wasp
Rate of climb (min.)	800 ft.	800 ft.	950 ft.	2,400 ft.	1,000 ft.
Service ceiling	15,100 ft.	15,100 ft.	16,000 ft.	24,000 ft.	12,000 ft.
Take-off run	550 ft.	550 ft.	540 ft.	100 ft.	900 ft.
Cruising range	500 mi.	500 mi.	650 mi.	525 mi.	450 mi.

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For those who are unable to arrange a personal visit, we have prepared Bulletin A-11.

NYAT

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INCORPORATED

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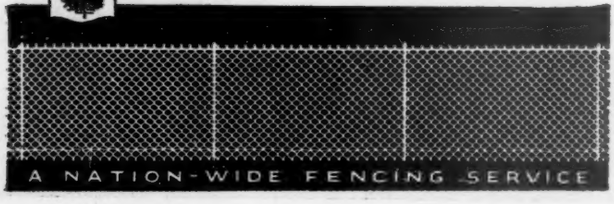

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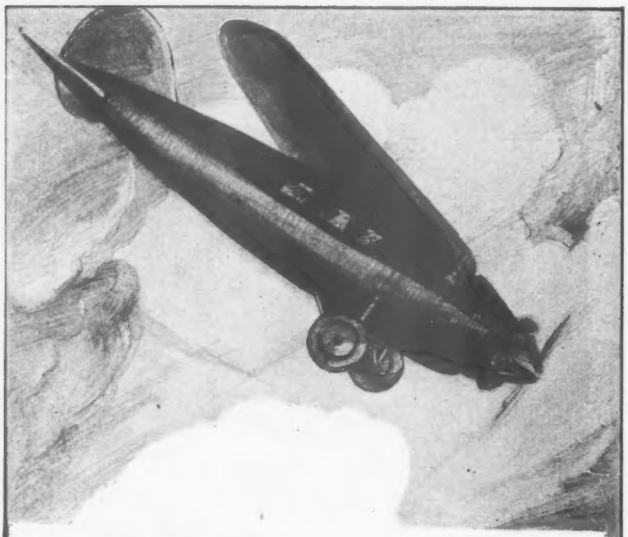

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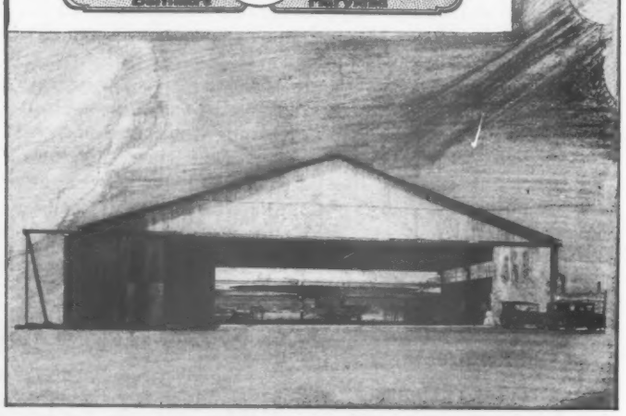

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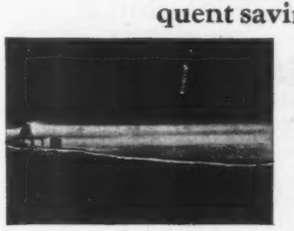

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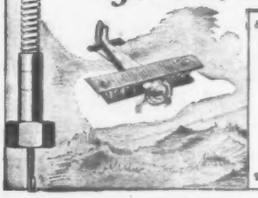

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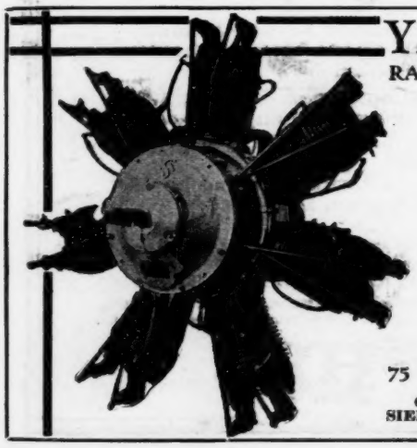

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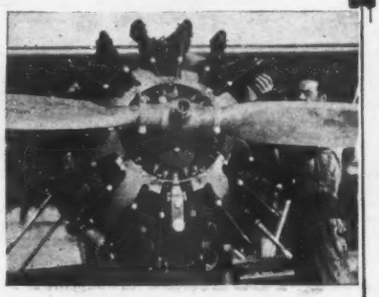

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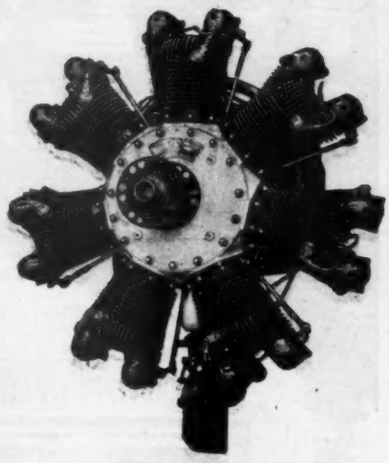
LE BLOND "90"



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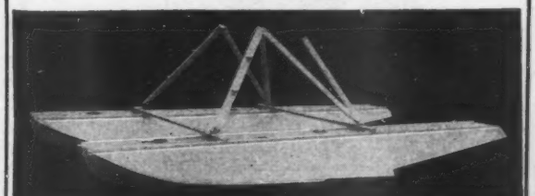

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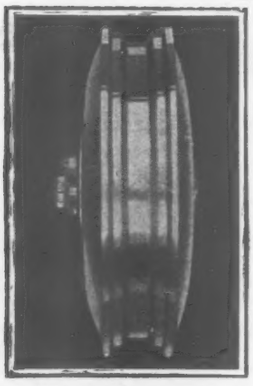

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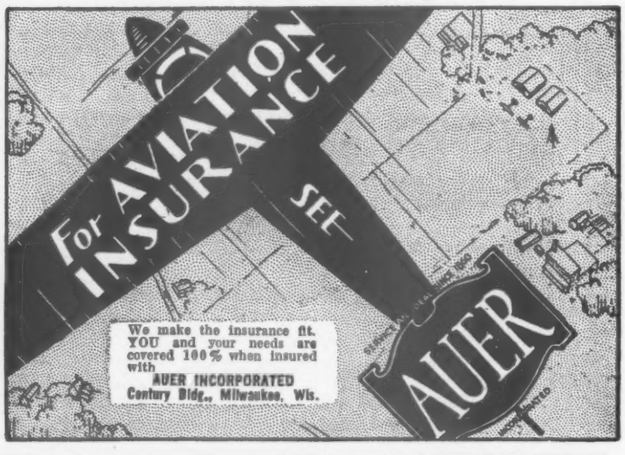
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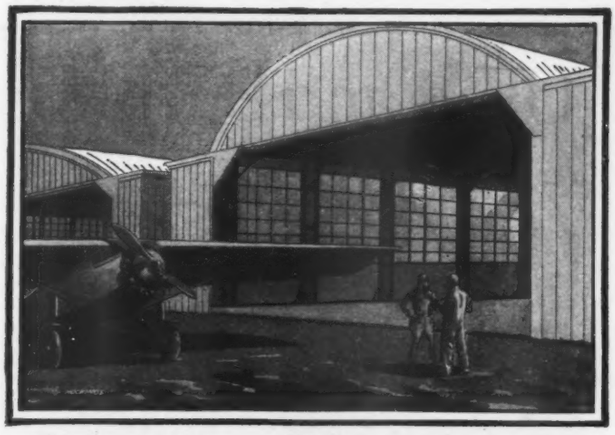

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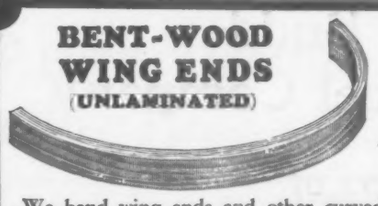

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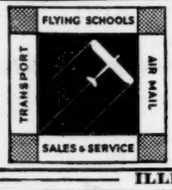

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Additional Where to Fly Ads on p. 41

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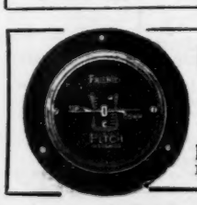
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FOR SALE

(Continued from preceding page)

FOR SALE—My private Waco J-6, 165 hp., that cost $6,777, equipped with Hamilton propeller and many other extras. Job has only twenty-two hours. I am buying Taperwing Waco and will sacrifice this beautiful job at $5,700. Nick Firestone, c/o Firestone Tire & Rubber Company, Akron, Ohio.

GREAT LAKES Trainer. Cirrus No. 3, 30 hours. Bargain for quick sale. Flight interstate. 551 Fifth Avenue, New York City.

HALL SCOTT, 100 hp. motor, new, 4 in line, overhead camshaft, dual ignition, $285; new three-place, all welded steel tubing fuselage (Skeleton), dual controls; has OX-5 motor mount. Steel landing gears, two new D. H. wheels, $175. J. A. Papkey, 455 Sumatra Ave., Akron, Ohio.

HEATH Parasol, new, knockdown, fuselage complete. Will sacrifice for immediate sale. Fred L. Koehler, 602 Arch St., Perkasie, Pa.

HENDERSON, 4 cylinder aircraft motor, latest type, with new propeller and hub, used only 10 hours. Price $150. E. Zubok, 1765 Sunnyside Ave., Chicago, Ill.

HISSO Standard, excellent condition, self-starter, automatic fire extinguisher, wing and fuselage gas tanks, automatic and hand gravity pumps, heavy duty propeller, duals, suitable for five place job. Two new unused tires. Ship flies daily. Will demonstrate and deliver within 300 miles. Need cash. $1,600. With or without motor. Never crashed. Harold Brannick, Dobbs Ferry Radio Shop, Dobbs Ferry, N. Y. Tel. 2214.

FOR SALE

LICENSED Pitcairn Fleetwing, OX-5 motor new when installed. Ship and motor had 68 hours. Perfect condition. Motor turns up 1,400 on ground. Hartzell propeller, duals, Pioneer compass. Wired for navigation lights. Reasonable. FS-217, Aviation, Tenth Ave. at 36th Street, New York.

MAGNETOS, tachometers, altimeters, air speed indicators. For expert test or repair service send them to Street Electric Company, 1312 Harmon Place, Minneapolis, Minn.

NEW OXX-6 motors in original boxes, very reasonable price. Will ship with privilege of inspection. Grant Marine Motor Company, 2625 St. Clair Ave., Detroit, Mich.

NEW 80 LeRhone propeller, $15. Grade "A" cotton, 36 in. 36c. yd. Zenith L7 carburetor $15. Speeditex 108 in. wide 95c. yd. Joe Edeskuty Aircraft, 1727 11th Ave. So., Minneapolis, Minn.

FOR SALE

ONE Roberts Airchild six cylinder 160 hp., two Bosch magnetos, Stromberg carburetor, propeller and oil radiator, had only 150 hours, now flying wonderful, for ship or student instruction, weight 410 pounds. Price $425. One OXX-6, just rebuilt, guaranteed to be A1 condition, $325. Two Wright E 180 Hissos, complete and in good condition, $475 each. One Hamilton high speed propeller for Hisso, $75. One Curtis Reed propeller, good as new for J-5 or 200 Hisso, $225. Finklea Bros., Leland, Miss.

OX-5 LINCOLN-PAGE, like new, flown 75 hours; motor turns 1,400; ready to fly, $1,-950. H. C. Brooks, 1801 Kessler Blvd., Indianapolis, Ind.

OX motors ready to mount, overhauled, $300 up. K-6 new Thompson valves, overhauled, cheap. Liberty six, test run, $300. Gar-Wood Liberty with exhaust manifolds and reverse gear ready for boat (overhauled), $700. Hisso A, overhauled and tested, $400. Hisso E, shallow lower case, salt-cooled valves, complete with new Hamilton propeller and spinner, $550. New Dixie 800 mags., Dixie and Bosch boosters. Oil tanks for Hisso or other types, 3 gal. $5 each. Seamless aluminum torpedo-shape gas tanks, weigh 15 lb. 40 gal., $15. Right and left Union, 120 hp. motors, complete with electric starters and all parts, new, $400 for pair. OX pusher propellers, Liberty, Hisso, Mercedes and other types cheap. Licensed Seagull C-6-A motor, Reed propeller, now flying, sacrifice price for quick sale. 220 Hisso ready to mount in boat with water-cooled exhaust and special pumps, flywheel and starter, $200. All material shipped subject to inspection. F. Mills, Essington, Pa.

FORD

TRI MOTOR

For Sale

J. 5 Motors

Total flying time on this plane, 232 hours

Used as private pleasure plane and for some sightseeing commercial trips, and therefore has been flown only under ideal weather conditions. Has had most careful and expert handling by best pilot and mechanic obtained from Ford Motor Co. This plane is in exceptionally fine condition.

Price: $30,000

JAMES R. CLARK
Provident Bank Bldg., Cincinnati, Ohio

A REAL BARGAIN

Must sell latest Model Irwin Metroplane, A-1 condition, Heath Henderson Motor. Equipped with tachometer, altimeter, air speed; oil pressure and oil temperature gauges. Switch. Has Department of Commerce identification Nos. $650 cash.

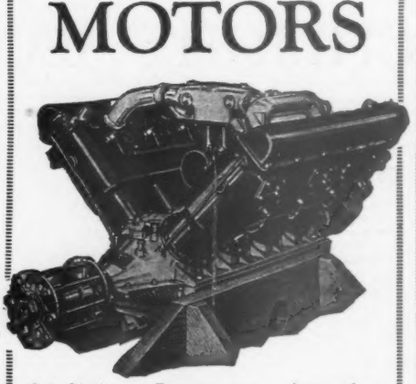
LELAND PECK
8 Olive Pl., Hornell, N. Y.

RYAN B-1

Nearly new, 1928 model. Flown only fifty hours. Brakes, tail wheel and fully equipped. Cost $12,000 delivered. Price $8,900 cash, free delivery.

SPEAR FOLKS
495 Congress Street, Portland, Maine.

MOTORS



2-cylinder Lawrence, Anzanies, OX-5's OXX-6's. 150, 180, 220 and 300 hp., Hispano-Suiza's Liberty's, LeRhones, etc.
Also lots of Hispano-Suiza parts of all descriptions.

KARL ORT
YORK, PA.

To make room for new equipment we are offering for sale a

Ryan B-1, J-5 in A-1 condition

MASSACHUSETTS AIRWAYS CORPORATION
Springfield Airport, Springfield, Mass.

TWO
Cessna Monoplanes

Either may be had with or without Wright J5 engines. Both have had less than 150 hrs. Also have complete line of Curtis OX5 spare parts and valve replacement jigs.

TEXAS FLYING SERVICE
800 Ft. Worth Club Bldg., Ft. Worth, Tex.

FOR SALE

Ryan Brougham

with Wright J-5

Fully equipped, 162 hours. Inertia starter, tour and bank, climb indicator, heater, compass, brakes, pneumatic tire tail wheel. Always in hangar. Motor and ship guaranteed perfect condition.

Price, $4,000

Joseph H. Dotterweich
438 Pratt St., Buffalo, N. Y.
Jefferson 1101—Telephone—Filmore 6399

FOR SALE

FOR SALE; 150 Hisso Jenny. Motor less than twenty hours since complete overhaul, turns 1,450 on blocks. All newly covered with Flightex fabric and never cracked up. Price $1,000. Also 1 aero upper wing and 2, 80 hp. LeRhone engines. FS-252, Aviation, Tenth Ave. at 36th Street, New York.

PARACHUTES, new and used, rope ladders for stunt men, etc. Specify weight. Thompson Bros. Balloon and Parachute Co., Aurora, Illinois. Established 1903.

RYAN Brougham J-5, motor overhauled at 200 hours, repainted. This ship is in first-class shape, real buy at $7,000. Travel Air, Hisso 180-E, with Scintilla mags., steel prop., instruments in both seats, bank and turn, brakes. Motor turns 1,500 on ground. Price $3000. Travel Air, OX-5, in first-class shape. Has just been recovered, $2,500. Waco 10, OX-5, has 80 hours on ship and motor, turns 1,460. Price $2,500. G. A. Stearns, 421 Fourth National Bank Building, Wichita, Kansas.

SALE—Jenny and Canuck, complete or parts, trade for what? H. W. Demaso, Chesterton, Indiana.

SPECIAL 180 Hisso-Eaglerock; practically new, located in New York City. Must be disposed of for financial reason. First reasonable offer accepted. FS-242, Aviation, Tenth Ave. at 36th Street, New York.

SWALLOW, licensed, A-1 condition, $1,800. Cash or can finance. 1383 Mathews Ave., Cleveland, Lakewood, Ohio.

TWO Waco tens with OX-5 motors. Good condition. Government license. Price 1,800 each. Dale Seitz, 209 No. 18th St., Kansas City, Kan.

WACO TENS—OX-5 motors, recently overhauled. Several late model planes, first class condition. Priced from $1,200 up. These ships are bargains. Washington Air Terminals Corporation, 239 National Press Building, Washington, D. C.

WASP motors for sale, nine (9) B type Wasp motors, with C type valves, in perfect condition. All have been thoroughly overhauled at intervals of less than 200 hours in our fully equipped shop at Oakland. Each motor will be completely overhauled just prior to sale to insure purchasers receiving motors in A-1 condition. Total time on motors varies and in each case sale price will be adjusted or pro rated according to time charged against each motor. Use of larger motors prompts this sale. For sale, at same time, Hamilton Wasp propellers and Star compasses. Those interested may hold this equipment for future delivery upon making 25% deposit. Pacific Air Transport (Boeing System). Oakland Airport, Oakland ,Calif.

EQUIPMENT WANTED

WANTED—2 Ruggles Orientators. State condition and lowest cash price at once. Rodeghier Motors, Joliet, Ill.

WANTED—Arrow Sport, with or without motor, in any condition. Leonard Reynolds, Box 123, Westport, Mass.

WANTED—LeBlonde, Kinner, Velie, J-4 and J-5 Wright motors and parts. The Detroit Aero Motors Co., 5055-5059 Townsend Ave., Detroit, Michigan.

WANTED—One Waco and fuselage or front half. Must be in perfect alignment and free from rust or other defects. Philip H. Rice, Y. M. C. A., Roanoke, Va.

WILL pay cash for airplanes, motors, propellers, instruments and airplane parts in any condition or quantity. Send complete details and price wanted in first letter. R. J. Bassett, 5615 Winthrop Ave., Chicago, Illinois.

WILL pay $4,000 to $7,000 cash for best offer of new or slightly used biplane or monoplane with J-5, J-6, five, seven or nine cylinder or Curtiss Challenger motor. Advertiser lives near New York City. Send full particulars and lowest price at once to W-239, Aviation, Tenth Ave. at 36th Street, New York.

POSITIONS VACANT

GENERAL manager with unquestionable business experience desired to manage air transport line and sales, base of operations in Ohio. State full experience and salary expected. P-235, Aviation, 520 No. Michigan Ave., Chicago, Ill.

POSITIONS VACANT

AERONAUTICAL engineer instructor with degree to teach airplane designing and stress analysis in an old established school. Also airplane construction foreman desired. State full particulars and salary expected in first letter. P-253, Aviation, Tenth Ave. at 36th Street, New York.

MECHANICS for final assembly. Must be experienced in factory assembly work. Apply American Aeronautical Corp., Whitestone, N. Y.

UNUSUAL opportunity for an assistant aeronautical engineer who really knows aerodynamics and stress analysis. Write Box 394, Glendale, Calif., giving details of your qualifications and salary expected.

WANTED: Draftsman, unusual future for the right man to work up. Lenert Aircraft Company, Pentwater, Mich.

WANTED, transport pilot, instruction and cross-country. Permanent for right man. Dependable. Robbins Flying Service, Akron, Ohio.

WANTED—By one of the leading aircraft factories of the country, a first class trim and paint shop mechanic, capable of later taking charge of department. In replying please give complete outline of experience. P-256, Aviation, 520 No. Michigan Ave., Chicago, Ill.

POSITIONS WANTED

AERONAUTICAL manager, capable assuming complete charge or handling all branches mechanical aeronautical instructions. Thoroughly experienced, capable and reliable. S. C. White, 230 Gates Ave., Brooklyn, N. Y.

LIMITED commercial pilot desires position with aviation company, preferably flying. Will work anywhere for expenses. H. C. Ross, 233 Prospect Ave., Crafton, Pennsylvania.

LIMITED commercial pilot, will fly for living expenses; 53 hours solo; age 22; high school education. Best references. A. Hieber, Box 673, Alliance, Ohio.

TRANSPORT pilot, plenty of experience as instructor, test pilot, cross country, manager of airport. Wish position with reliable concern. What have you to offer. PW-247, Aviation, 520 No. Michigan Ave., Chicago, Ill.

TRANSPORT pilot, 7 years' experience, 1,000 hours cabin and open ships, 2 years' college, married, desires change; employed at present; licensed mechanic; sales experience. PW-230, Aviation, 520 N. Michigan Ave., Chicago, Ill.

UNLICENSED mechanic, single, primarily interested in getting mechanic's license, desires position. Graduate of Parks Mechanics' School. Extensive automobile overhaul work and aircraft experience. PW-255, Aviation, Tenth Ave. at 36th St., New York.

YOUNG man, 35 years old, wants position in aviation field. Have had 12 years' experience as automobile mechanic, but will do anything to help get mechanic's license. Kenneth Bristol, Belchertown, Mass.

MISCELLANEOUS

ATTENTION Aviators: Valve guides installed on OX cylinders, $1.50 per guide; removable valve seats installed, $1.00; descriptive literature upon request; all work guaranteed. Illinois Flying Co. New location, 4 West 4th St., Sterling, Ill.

REBUILD your OX5 with removable graphite guides, inserted seats and oversize valve action pins. OX5 and Hisso parts. Write for circular. Heckman Machine Works, 4026 West Lake Street, Chicago, Illinois.

HERE it is $49.75, welded steel fuselage, fits any sport plane wing, other parts at cut rate prices. H & H Fuselage & Motor Company, 2903 Mt. Vernon, Ft. Worth, Texas.

FLIGHT SURGEON

Graduate of Army School of Aviation Medicine, World War experience, now Department of Commerce Examiner at large aviation center, with excellent medical training, desires place with large transport company as flight surgeon.

PW-251, Aviation
520 N. Michigan Ave., Chicago, Ill.

Aeronautical Exposition

AIR RACES

MEMPHIS, TENN.

SEPT. 28—OCT. 5

in connection with

MID-SOUTH FAIR

$2,000 IN CASH

and other attractive prizes

Free Exhibition Space

Write or Wire for Particulars

FRANK D. FULLER, Secy.
MEMPHIS, TENN.

AVIATION—Salary while learning, $18 to $35 per week, while under instruction in our factory and shops. Call or write for information without obligation. AERO CORPORATION OF AMERICA, Department AV. 63 Second Street, Milwaukee, Wisconsin.

Learn Welding

LEARN WELDING and lead burning in the best equipped school in St. Louis; day and evening instruction; no classes; each student has unlimited personal instruction; no time limit. Full course on all the common metals, including aeronautical tubing; only $100. Get your money's worth. Aeronautical Engineering Company, 2903 Shenandoah Ave., St. Louis, Mo.

. . . . *Opportunity to Buy*

Cabin Plane and Design

One of the leading commercial aircraft manufacturers has an 8-place cabin monoplane, with design and engineering data, less Wright J-5 motor, for sale. The design is by a nationally recognized aeronautical engineer. The ship has been satisfactorily test flown and only the manufacturer's decision to concentrate in the small ship field prevents it being placed in production. This is an attractive purchase for a manufacturer who wishes to enter the cabin field with most research completed or for a newly incorporated company wanting something tangible to offer its stockholders. Priced for immediate action.

Box FS-172, Aviation Magazine
Tenth Ave. at 36th St., New York City

Wasp Travel Air, Type 6000, 6 Place Cabin Monoplane

This ship is practically new, having been flown 40 hours only. Toilet and lavatory, full night flying equipment. List Price $18,500. Will sell for $15,000.

The Little-Greiner Flying Service, Inc., Springfield, Ohio

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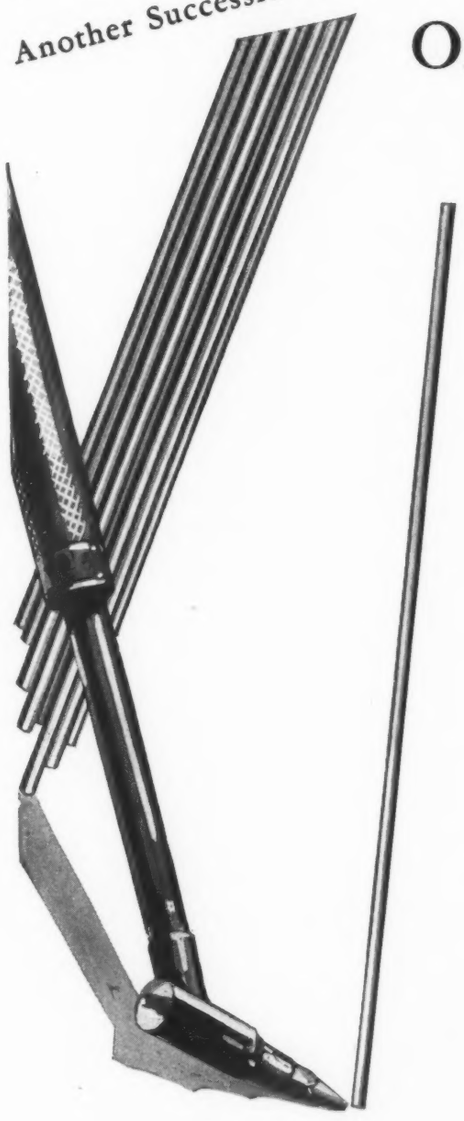
Introducing

Another Successful Union Carbide and Carbon Research Laboratories Development

Oxweld No. 21 High Strength Bronze Welding Rod



SUPERIOR for all bronze-welding operations — equally adaptable for steel, cast iron or copper alloys — produces a sound, fine-grained weld metal of superior qualities of strength, toughness, ductility and freedom from porosity.

Oxweld No. 21 High Strength Bronze Welding Rod requires less time to apply and less oxygen and acetylene. It makes high strength bronze welds easier and cheaper.

This new rod is easily worked. It can be more rapidly tinned on a steel or cast iron surface. It has a low melting point — melts and freezes quickly and evenly. Remelting has no effect on either the quality or appearance of the finish weld.

Ask any Oxweld representative for the whole story. Or, just order a supply from the nearest Oxweld warehouse.

OXWELD

WELDING AND CUTTING APPARATUS AND SUPPLIES

OXWELD ACETYLENE COMPANY
Unit of Union Carbide and Carbon Corporation

NEW YORK
Carbide and Carbon Bldg.

UCC

CHICAGO
Carbide and Carbon Bldg.

SAN FRANCISCO
Adam Grant Building

IN CANADA: Dominion Oxygen Company, Toronto

STOCKS IN 38 CITIES

He who goes aloft today—
will get his friends to follow!

THE public's knowledge of flight is largely second-hand—its interest is all too much "for the other fellow." The speed of flying, the safety of planes, the endurance of good engines has been repeatedly proven. But 110,000,000 Americans are on the ground instead of riding the air.

Some of course will never go up. Thousands will go once and remain anchored to earth thereafter. But still other thousands upon thousands will think with delight of their glorious, practical adventure and repeat and repeat.

Aviation will grow as its "First Flight Club" grows. And the way to spin out the miles . . . to build better motors . . . and more able planes . . . is to bring flying within the reach of *all* the earth-bound—to encourage by word, by deed, and by opportunity given, the millions who ought to fly but do not.

For the true day of aviation dawns when the ownership of a plane is a serious and sensible question . . . when a man and his family choose the make and model best suited to their needs . . . as today they choose an automobile.

Wright seeks to place flying on a practical, business basis. So that all can make their first flight in utter confidence . . . in a knowledge that everything is shipshape and secure . . . from Whirlwind engine to tail skid.

WRIGHT
AERONAUTICAL CORPORATION
PATERSON, NEW JERSEY

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